DOCTORAL THESIS

Interaction among firm strategy, board control role, information attributes in association with firm performance

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INTERACTION AMONG FIRM STRATEGY, BOARD CONTROL ROLE, INFORMATION ATTRIBUTES In ASSOCIATION WITH FIRM PERFORMANCE

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STATEMENT OF SOURCES

To the best of my knowledge and belief, the work presented in this thesis is original, except as acknowledged in the text. All sources used in the study have been cited, and no attempt has been made to project the contribution of other researchers as my own. Further, the material has not been submitted, either in whole or in part, for a degree at this or any other university.

Christopher Robert Gunther

ABSTRACT

This study develops and tests a theory that an interaction exists amongst the information attributes of strategic performance measurement systems (SPMS), the board control role and the organisation's strategy as measured by a composite index of firm performance(Muth & Donaldson, 1998). Research suggests that organisational control is accomplished through performance evaluation, which emphasises the information aspects of control (Eisenhardt, 1985). In addition it is argued that there is a parallel between the use of organisational control systems (financial control and strategic control) by boards and top management teams (TMTs) (Goold & Quin, 1993; Gupta, 1987; Hitt, Hoskisson, & Ireland, 1990). What is unclear is the role information aspects may play. A significant three-way interaction exists when performance is observed by the accounting return EBIT, but is, however, not significant when associated with shareholder returns as the performance measure. The findings contribute to board SPMS practices, information attributes, and the corporate governance literature.

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Firstly, to my supervisor Lyndal Drennan, who I have enormous respect for, I am eternally grateful for your sound advice and direction.

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CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

The purpose of this research is to identify those combinations of board role, strategy choice, and Information Attributes which, when incorporated into a board's Strategic Performance Measurement System (SPMS), are associated with superior firm performance.

"Over time, the definition of the roles and responsibilities of corporate boards has changed. But there's general agreement that a board has a fiduciary duty to represent a corporation's interest in protecting and creating shareholder value and must determine whether the company has managed to realize long-term success" (Epstein & Roy, 2004, p. 3).

To fulfil these responsibilities effectively, boards must have relevant and reliable information to manage the cause and effect relationship of the drivers of corporate success and, thus, improve the company's performance. However, the literature regarding the characteristics and nature of the information that boards require in order to help them achieve this is limited and, in many instances, is of a general nature, not specific.

Boards and, consequently, their information requirements are complex by nature as they have dual responsibilities to the corporate organisations they serve and to the shareholders and external stakeholders. To be competitive, grow, or take advantage of core competencies and synergies, organisations either diversify or remain in a single industry and as such, have complex information characteristics and requirements.

In addition, boards are limited in their ability to meet all the expectations placed upon them when setting priorities and allocating time, and as a result, they focus only on the roles for which they are held accountable and where they have the greatest leverage or influence (Lawler, Finegold, Benson, & Conger, 2002).

Research from an organisational and management control perspective introduces theories, typologies, and contingency frameworks that provide evidence of Information Attributes seminal to board effectiveness, which presents opportunities to explore the question of what Information Attributes in SPMS are associated with superior firm performance.

Information Attributes are qualities or characteristics inherent in information. The Information Attributes: lead/lag, subjective/objective, feed-forward/feedback, and non-financial/financial are common in both Organisational Control theories (OC) (Eisenhardt, 1985) and Management Control Systems (MCS) and Strategy (Langfield-Smith, 1997), and also in SPMS (Kaplan & Norton, 1996) and the Hendry and Kiel (2004) typology, which explains the board's role in strategy. This research tests a theory that the interaction among Information Attributes found in SPMS, the Board's Control Role, and the organisation's Strategic Configuration is associated with Firm Performance.

1.1 MOTIVATION

The purpose of this research is to improve board and corporate governance efficiency by identifying Information Attributes in SPMS that are associated with superior firm performance. It is the intention of this research to add to the organisational control and board literature by increasing our understanding of the circumstances and knowledge demands that different types of boards, with different strategies, deploy in this quest to deliver firm superiority.

1.1.1 Information Practices

Research provides evidence that boards which adopt certain key 'best practices' are able to govern more effectively and produce better financial performance for the firm (Lawler et al., 2002). The primary findings are that boards with 'better information' practices (Pingying, 2010), are the most effective (Lawler et al., 2002). In addition, Lawler et al. (2002) attribute board effectiveness (Payne, Benson, & Finegold, 2009) to efficient governance practices and strategic practices. They find that boards with a high use of best practices rate information and strategic practices as the most important practices. In addition, the importance of adopting better information practices is evident when Lawler

et al. (2002) test their impact on Firm Performance.

1.1.2 Corporate Governance

Given the board's role in corporate governance, this study is motivated by the need to extend what is considered the dominant corporate governance and firm performance framework (Dalton, Daily, Certo, & Roengpitya, 2003) by integrating board theories to open up the black box of actual board behaviour (Huse, 2005). In addition, an alternative approach to the dominant corporate governance model (Principal-Agent model) also motivates this study.

Best Practice Corporate Governance

The late twentieth century's dominant corporate governance model, the Principal-Agent or Finance Model (Letza, Sun, & Kirkbride, 2004), associates governance with Agency Theory (Jensen & Meckling, 1976). The corporate purpose of maximising shareholder wealth with the focus on shareholder rights as a result of the separation of ownership and control (Shleifer & Vishny, 1997b) is a central theme of this model. However, when common themes, which are accepted as best practice corporate governance, are tested for their association with higher corporate financial performance, a substantial body of empirical research yields disparate and conflicting findings (Dalton et al., 2003; Dalton, Daily, Ellstrand, & Johnson, 1998).

Dalton and Dalton (2005) consider two arguments at the centre of corporate governance best practice: structural independence and alignment of interests. Structural independence is captured by two measures: board composition (independent directors) and board structure (CEO duality). These are common themes to both the Higgs Report and the Sarbanes-Oxley Act. Also referred to as board power, they are regarded as the metaphorical lightning rod in corporate governance debates (Dalton & Dalton, 2005).

However, even after a substantial body of corporate governance, agency theory, and firm financial performance empirical research, a meta-analyses of 457 studies over 70 years (Dalton et al., 2003; Dalton et al., 1998) finds that these studies demonstrate little consistency and yield disparate findings

and "are in stark contrast to current admonitions regarding corporate governance 'best practices' " (Dalton & Dalton, 2005).

Dalton and Dalton (2005) suggest that structural independence must be accompanied by effective board processes. By the mid-2000s, with the evolution of boards and governance research, it had become evident that there was a need for an expanded and alternative framework (Roberts, McNulty, & Stiles, 2005). Huse (2005) offered an extended framework, using a contingency and integrated theories approach, to open the black box of actual board behaviour. The framework is centred on creating board accountability where pluralistic board theories (i.e. resource dependent, stewardship, and, managerial hegemony) create board role expectations.

An Alternative Approach to Agency Theory Corporate Governance

In acknowledging the limitations of the Agency Theory Corporate Governance Model, this research develops an alternative "information" approach to governance and firm performance, that of Information Asymmetry and Governance (Zahra & Filatotchev, 2004). Agency theory assumes that the key role of governance is curbing opportunistic behaviour. Knowledge-based arguments applied to formulation of the theory of the firm (Conner & Prahalad, 1996) question the assumption of opportunism. The Resource-Based-Knowledge-Based-Theory of the Firm is regarded as the fourth[1] seminal contribution to the theory and articulates a knowledge-based perspective that is independent of opportunistic considerations. The assumption is that the actors in the governance system—in this case, boards of directors—have different experiences, insight, skills and tacit knowledge (knowledge learned through personal experience). While these differences influence managerial decision-making,

[1] The other three contributions are: 1. Coase (1990) originally established a comparative organisational reasoning crucial to the theory of the firm and also introduced the fundamental concept of transaction costs. 2. Simon (1957) advanced the motivating behavioural assumption of bounded rationality and also established the employment -- authority -- relationship as the incisive distinction between a firm and market contracting. 3. Williamson (2010) explored the concept of bounded rationality in the context of choosing an organisational mode: opportunistic potential. Williamson's predictive theory operationalised an important aspect of the transaction cost approach.

they are akin to Milgrom and Roberts' (1987) theory on the existence of private information or information asymmetry. They suggest that the "recognition of informational asymmetries and the strategic possibilities they engender yield models that begin to capture the richness of behaviour that marks the real world" (p. 185).

1.1.3 Policy Reforms

Boards of directors face new risks and burdens as a result of the dramatic changes in disclosure and corporate governance rules and penalties in the wake of recent scandals. Qualified individuals are increasingly reluctant to serve on public boards (Kerr & Werther Jr., 2008). Many publicly traded companies are contemplating whether it would be advisable to terminate their public company status. 'Going private' bears testimony to the significant new imposed personal liability[2] (Block, 2004; Engel, Hayes, & Wang, 2007).

Responding to public policy reforms almost twenty years ago, Baysinger and Hoskisson (1990) suggested tailoring corporate governance to the information requirements of different strategies rather than board structure. Baysinger and Hoskisson (1990) stated that this "should be considered before new board reforms are implemented" (p. 85). Yet today, without knowing the impact of information on the board and its performance in delivering superior firm performances, board reforms are being promulgated in most jurisdictions.

1.2 SPECIFIC PROBLEM

Research from an organisational and management control perspective introduces theories, typologies, and contingency frameworks that suggest Information Attributes are seminal to board effectiveness.

[2] In the USA, board members and members of audit committees who violate new personal certification requirements imposed by the Sarbanes-Oxley Act are subject to civil actions and in criminal proceedings may be fined up to $5 million and imprisoned for up to 20 years.

1.2.1 Board's Control Role

Hendry and Kiel (2004) propose a board typology and a contingency framework that allow this research to propose an association between the Board's Strategic Control Role and Information Attributes. By recognising a board's 'passive (rubber stamp)/active (board as management) continuum' in strategy and the board as a control mechanism, Hendry and Kiel (2004) characterise a board's strategic role based on two control constructs: financial control and strategic control. The Information Attributes of financial control are described as outcome, objective, post-implementation, and associated with lag indicators. The Information Attributes of strategic control are described as behavioural, subjective, pre-implementation, and associated with lead indicators (Hendry & Kiel, 2004). They propose that, depending on contingencies, their constructs (financial control and/or strategic control) and information characteristics will differ depending on whether the board's strategic roles are active or passive.

In recognising the board as a control mechanism, Hendry and Kiel (2004) draw on combined Organisational Theory and Control (Ouchi, 1979) and Economic (Agency Theory) Control (Eisenhardt, 1985) perspectives. Both perspectives accomplish control through performance evaluation, which emphasises the information aspect of control. In addition, the control perspectives parallel both boards of directors and Top Management Teams (TMT) (Goold & Quin, 1993; Gupta, 1987; Hitt et al., 1990), thus affording the opportunity to place Performance Measurement Systems (PMS) and Management Control Systems (MCS) within the scope of this study.

1.2.2 Board's Strategic Role

There is general agreement in the literature that boards have three key roles: strategy, control, and service (Johnson, Ellstrand, & Daily, 1996; Stiles & Taylor, 2001; Zahra & Pearce II, 1989). However, as perceived by boards of directors, most time is spent on implementing, monitoring, and shaping (Weitzner & Peridis, 2011) the firm's strategy (Lawler et al., 2002; Pugliese, Bezemer, Zattoni, Huse, Van den Bosch, & Volberda, 2009). In addition and as mentioned previously, Lawler et al. (2002) have identified strategic board practices (e.g. identifying potential risks to the firm and spending time

on long-term strategy) as highly important on their board effectiveness scale.

Other management disciplines also support the strategic role of boards. For example, Organisational Behaviour suggests that strategic advice and counsel are essential in the running of modern corporations and are critical of 'rubberstamp' boards (Finegold, Lawler III, & Conger, 2001). From a legal perspective, the board's fiduciary duty is generally considered to include the review and monitoring of strategy (Stiles & Taylor, 2001). Finance considers how particular strategic initiatives will lead to superior financial returns for the company. Since financial metrics tend to be lagging indicators, the board must therefore determine relevant leading indicators. Typically these will be non-financial and will indicate where the strategy is going and what foundations are being laid for the future (Frigo, 2003).

An approach by governance disciplines proposes a system characterised as a 'strategic board' to fulfil a board's strategic role and ensure effective corporate governance process (O'Neal & Thomas, 1996). Kerr and Werther Jr.'s (2008) 'Next Frontier in Corporate Governance' describes an evolving role in approaching strategy as the logical extension of its fundamental fiduciary responsibility to represent and protect shareholder interests. The management literature on the board's strategic role is extensive and will be discussed in the literature review. However, of particular relevance to this study is the 'active/passive' continuum, which describes the potential important roles directors are capable of playing in shaping the strategic direction (Zahra, 1990).

Having identified strategy as a key board role, this research adopts the view of strategy as providing the basis for an iterative process of objective setting and resource allocation (Burgelman, 1983, 1991; Noda & Bower, 1996).

The evidence provided from organisational and management control perspectives above presents a framework for observing if Information Attributes are associated with a Board's Control Role Type and are, in turn, linked to the firm's Strategic Configuration and ultimately associated with superior Firm Performance.

To test these associations, data will be collected using the 'written questionnaire' survey methodology and supplemented with archival data about firm performance. The research population is boards of publicly listed companies on the ASX in 2008 and 2009. The respondent representing each board will be the chair of that board.

1.3 CONTRIBUTION OF THE RESEARCH

The objective of this research is to test a theory that an interaction among Information Attributes found in SPMS, the Board's Control Role, and the organisation's Strategic Configuration is associated with superior Firm Performance. In doing so, this research will contribute to four areas of study: research, regulation, practice, and education.

1.3.1 Contribution to Research

This research will contribute to the information attribute, board of directors, and firm performance research. This research will add to the body of corporate governance and firm performance research, responding to the call 20 years ago by Baysinger and Hoskisson (1990) to tailor corporate governance to the information requirements of different strategies. The study will attempt to validate typologies and frameworks in the strategic and organisational control discipline and associate information attributes with firm performance. By understanding more about the information received by boards, this research will contribute to the discussion of how boards of directors can more effectively acquit their obligations to implement strategy and deliver firm performance.

1.3.2 Contribution to Regulators

The implication for regulators arises from the observation that information provided to boards can make a difference to governance and company performance. Regulators and boards will be provided with guidance as to which information should be regarded as best practice in certain defined circumstances. By identifying performance relevant information to boards in process and in strategy, regulators will then be able to form opinions as to whether boards have chosen to follow demonstrated

best practice.

1.3.3 Contribution to Practice

This research will enable boards to design and implement performance control mechanisms that have a greater chance of contributing to better firm outcomes. The control system requires relevant performance measures to be an effective mechanism in directing management activities. It will contribute to the practice of organisational control and specifically to the implementation of strategy. Observing relevant lead and lag performance measurements provides firms with early warnings as to whether they are on target to achieve strategic goals. In addition, cause and effect relationships enable firms to take pre-emptive actions in improving the chances of achieving strategic goals.

1.3.4 Contribution to Education

At present, management accounting education tends to emphasise the information needs of Top Management Teams (TMT) through to lower levels of management within an organisation. While there is a belief amongst business scholars that information is useful and relevant, there is limited empirical evidence to support this from the board's perspective. The contribution of this research to teaching is that it may assist educators to make control system learning relevant, and extend this relevance to boards as well as management.

1.4 STRUCTURE OF THE THESIS

This thesis is structured as follows: Chapter 2 reviews relevant literature and Chapter 3 develops the theory and hypotheses to be tested. Chapter 4 describes the research methodology, while Chapter 5 determines the variables. Chapter 6 presents the analysis and findings from statistically testing the hypotheses and discusses the impact and meaning of the findings and their contribution to practice and theory. Chapter 7 summarises and concludes the study.

1.5 CHAPTER SUMMARY

This chapter introduces the study and its purpose. It discusses the complex nature of boards and their information requirements. The recognition of important board information practices, together with an alternative corporate governance approach and implications for policy reforms, motivates this study. The chapter then describes the board's control role in strategy with different information attributes (the nature and characteristics of information). The chapter concludes by outlining the contribution of this research to research, regulators, practice, and education.

CHAPTER 2

LITERATURE REVIEW

2.0 INTRODUCTION

The aim of this research is to develop and test a theory that an interaction, if observed, between Information Attributes found in Strategic Performance Measurement Systems (SPMS), the Board's Control Role, and the firm's Strategy Configuration will be associated with Firm Performance.

Research suggests a shift away from a passive board control role to a more active board control role (Hendry & Kiel, 2004). In addition, the board as 'no more than a sign off on strategy' appears to be rare (Stiles, 2001) .

The board of director literature (more specifically the role of the board), board process, and the impact of boards on corporate performance is reviewed. The gap and paucity in the board literature on the role that information plays in supporting effective boards is established.

Chapter 2 proceeds as follows: Section 2.1 reviews the board role literature from a multi-disciplined board theory perspective and a three-period review is presented. Section 2.2 reviews the board and strategy literature, and Section 2.3 reviews strategy and Management Control Systems. Section 2.4 reviews the board and information literature. Section 2.5 reviews the corporate performance literature and Section 2.6 summarises the chapter.

2.1 BOARDS OF DIRECTORS: A REVIEW OF THE LITERATURE

Board effectiveness refers to the board's ability to perform its roles, move the company closer to its strategic goals, and satisfy shareholders' interests (Petrovic, 2008). Two streams conceptualise the roles that boards of directors perform (Petrovic, 2008). The first considers that board roles are direction (strategic guidance) and control (strategic implementation). The second stream is board role theories (Huse, 2005) and/or estimates of board actions (Hermalin & Weisbach, 2003).

The Zahra and Pearce II (1989) seminal paper is regarded as the starting point in board and corporate governance research (Gabrielsson & Huse, 2004; Hendry & Kiel, 2004; Johnson et al., 1996). The extent to which boards undertake their roles is guided by the theoretical perspectives (Zahra & Pearce II, 1989). The theory has its origins in diverse disciplines, which are reviewed from two perspectives: Economic and Finance (agency theory) (Hermalin & Weisbach, 2003) and Organisational, Sociological and Managerial (stewardship, class/managerial hegemony and resource dependent theories) (Huse, 2005; Pettigrew, 1992; Zahra & Pearce II, 1989). To identify the literature relevant to this research, the focus then shifts to a three period review: 1990s and earlier; 1990 to around 2000; and 2000 to present.

2.1.1 Economic and Finance Perspective

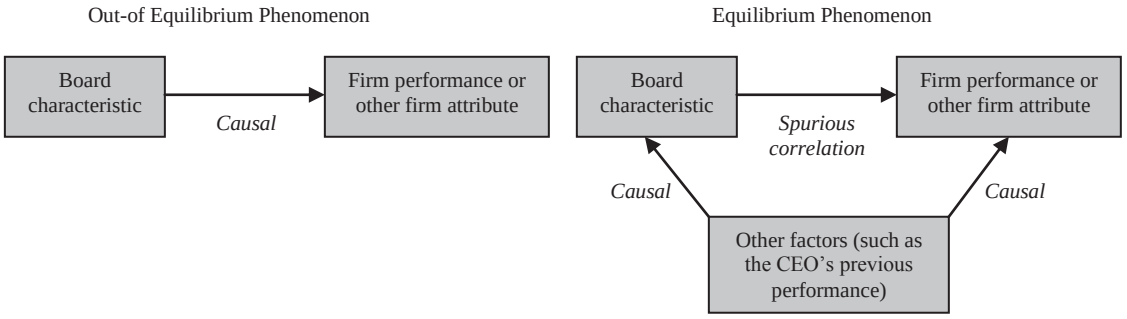
While the formal economic theory on boards is quite limited, the empirical literature is well developed (Hermalin & Weisbach, 2003). Smith (1776) first articulated what is referred to as the agency problem, an important theory for corporate governance and boards of directors (Huse, 2005; Roberts et al., 2005). Economists, some 150 years later, take a similar view (Berle & Means, 1932).

One potential answer to the question of why boards exist is that they are simply a product of regulation (Hermalin & Weisbach, 2003). However, Hermalin and Weisbach (2003, p. 9) offer a more plausible hypothesis: "boards are a market solution to an organizational design problem, an endogenously determined institution that helps to ameliorate the agency problems that plague any large organization". As such, agency theory provides solutions to the dilemma of separation between ownership and control (Fama & Jensen, 1983), with the board positioned as a mechanism to align interests. Public discussion and corporate governance reforms still, however, dominate the economic and financial perspectives, suggesting aspects are not adequately explained by agency theory.

A notable key issue in the empirical work is how to proxy for the board's degree of independence from the CEO. Often, an implicit assumption is that observable board characteristics such as size or composition are related to the level of independence (Hermalin & Weisbach, 2003). According to Hermalin and Weisbach (2003), two important concerns complicate empirical work on boards of

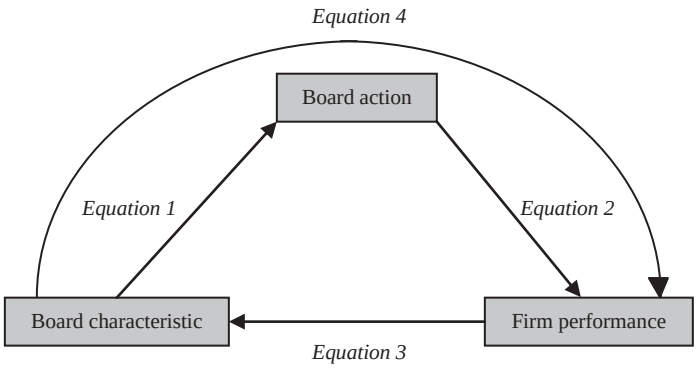
directors. First, almost all the variables of interest are endogenous (actions of previous directors' influence subsequent directors). Second, empirical results can be interpreted as either an equilibrium or an out of equilibrium phenomena (refer to Figure 2.1).

Figure 2.1 Board Equilibrium Phenomena (Hermalin & Weisbach 2003, p. 8)



Empirical literature on the studies on boards of directors are characterised by estimating equations (refer to Figure 2.2) (Hermalin & Weisbach, 2003). In interpreting the illustration, firm performance (i.e. accounting, economic and share performance measures), as a dependent variable, can be explained by the independent variables: board actions (i.e. takeovers), poison pills, executive compensation and CEO turnover, and board characteristics (i.e. composition) and board size. Firm performance as an independent variable can also explain board characteristics as a dependent variable. In addition, board characteristics as an independent variable can explain board actions as a dependent variable.

Figure 2.2 Board Empirical Equations (Hermalin & Weisbach 2003, p. 12)



Equations 1 and 2 have the advantage of being less prone to any unobservable factors contaminating a statistical relationship and it is less likely that endogeneity will affect the results (Hermalin & Weisbach, 2003). Despite the fact that the composite Equation 4 is more prevalent than the studies of component Equations 1 and 2, making it possible to establish a direct board characteristic and firm performance relationship, the equilibrium phenomenon needs to be addressed.

2.1.2 Organisational, Sociological and Managerial Perspectives

As a result of the call for greater theoretical pluralism in understanding board and governance phenomena, the dominant agency theory grip on governance research (Huse, 2005) (Roberts et al., 2005) has been challenged and supplemented by resource dependence, stewardship, class and, managerial hegemony theories (Barroso, Villegas, & Pérez-Calero, 2011; Davis, Schoorman, & Donaldson, 1997; Hendry & Kiel, 2004; Zahra & Pearce II, 1989). With their theoretical origins in organisational, sociological, and managerial disciplines, they characterise board roles in reference to board effectiveness (Petrovic, 2008).

The board effectiveness literature described as structural analysis and board dynamics (Petrovic, 2008) or structural and process analysis (Dalton & Dalton, 2005; Pettigrew, 1992), are mechanical issues often addressed by regulation and organic issues that cannot be regulated (Sherwin, 2003). Mechanical issues or structural analysis are predominantly grounded and guided in agency and managerial hegemony theory (Dalton & Dalton, 2005; Pettigrew, 1992) and studied in the input-output model between the ‘usual suspects’ (i.e. board structure and size) and in the corporate financial performance framework (Gabrielsson & Huse, 2004). Organic issues or board dynamics/process analysis, on the other hand, are studied under the behavioural framework where it is suggested that multiple theoretical perspectives are required to fully understand board behaviour (Gabrielsson & Huse, 2004).

The literature, in questioning board effectiveness (structural and process analysis), identifies with the following phenomena:

- Inferential Leaps: The imbalance between structural analysis (agency theory studies) and process analysis (multiple theoretical perspectives) (Pettigrew, 1992), quoted as "easily measurable demographic characteristics used as surrogates for unobserved intervening processes and inferential leaps are then made to a range of organisational outcomes" (Pettigrew, 1992, p. 177).

- Black Box: A potential solution to the imbalance between structural analysis (agency theory studies) and process analysis (multiple theoretical perspectives), argues for the need to open the black box of actual board behaviour to bridge the gap between board role expectations and board effectiveness (Huse, 2005).

- Unicorns: The continuing imbalance among structural analysis (agency theory studies), process analysis (multiple theoretical perspectives), and board research. A meta-analysis of 457 studies over 70 years on structural independence (structural analysis) and corporate financial performance in 2005 still found no evidence that the "unicorn" exists (Dalton & Dalton, 2005).

2.1.3 Three Period Review on Boards

Up to 1990

Still in its infancy by the early 1990s (Pettigrew, 1992), the late 1970s observation (Tricker, 1978) that boards of directors were the most under-researched management topic was still accurate. Methodological difficulties and poor response rates from questionnaire-based studies contributed to inconclusive theoretical and empirical findings. However, policy interest in boards in the UK and the US produced a constant stream of prescriptive literature under differing themes: board composition,

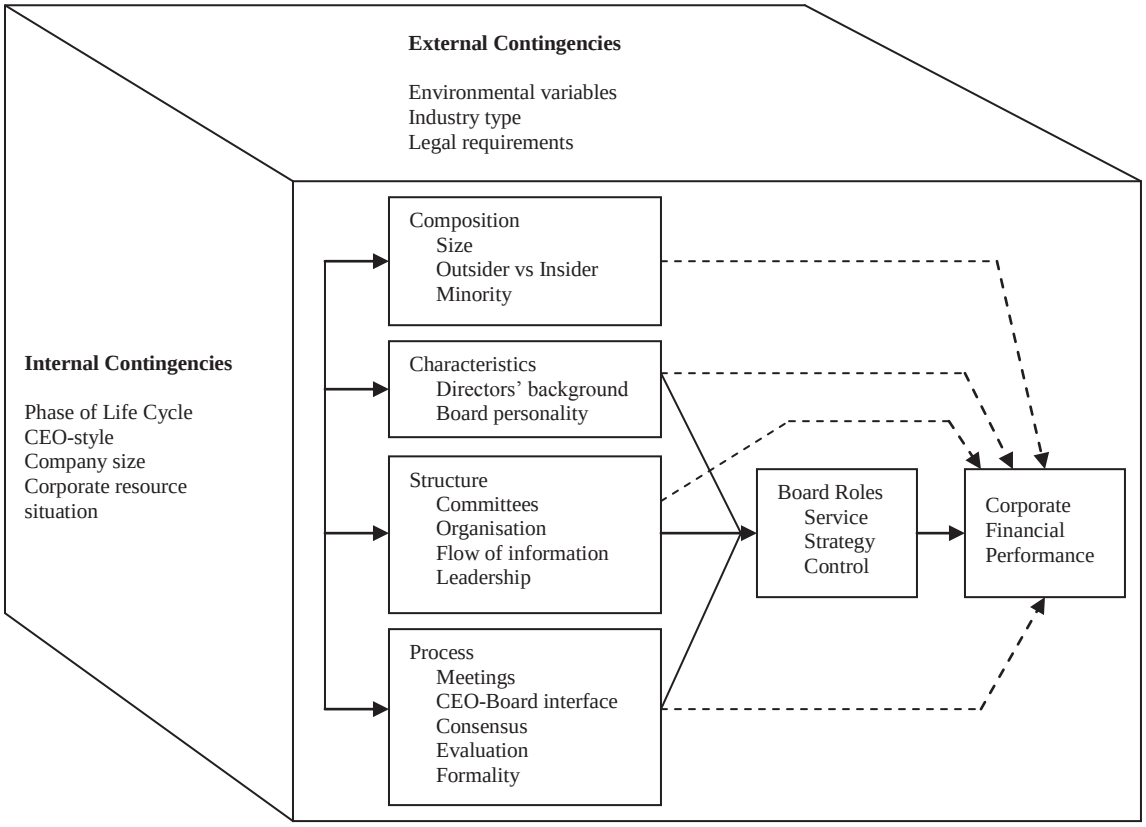
firm performance, director roles, corporate governance initiatives, board effectiveness, take-overs, CEO responsibilities, CEO duality, board power, greenmail, legal charges, parachutes, and poison pills (takeover defence), and decision behaviour.

Huse (2005) offers an interesting perspective on boards in the 1980s, describing it as a first wave of shareholder activism led by institutional investors and guided by agency theory. They wanted boards sufficiently independent to resist managerial dominance or hegemony.

In the 1990s, the first framework for studying boards was introduced by Zahra and Pearce II (1989). The study reviewed empirical research published at that time on the contribution boards of directors made to corporate financial performance and is regarded in most disciplines (management, economics, finance and sociology) as the starting point of board and corporate performance research (Gabrielsson & Huse, 2004; Hendry & Kiel, 2004; Johnson et al., 1996). Guided by four distinct theoretical perspectives (legalistic[3], resource dependence, class hegemony, and agency theory), Zahra and Pearce II (1989) present an integrative model (refer to Figure 2.3) and propose specific links amongst attributes, roles, and contingencies.

[3] The literature addressing a director's control role suggests legal theory is less specific in identifying a director's duty to shareholders than agency theory. The agency theory perspective (Jensen & Meckling 1976; Eisenhardt, 1989) differs from the legal perspective. In practice, most courts have rejected the agency perspective (Budnitz, 1990); however, the primary difference, though more similar than different, between these two perspectives is in the source of director's power. Legal theory emanates from law, whereas agency theory suggests director's power is derived from shareholders (Budnitz, 1990).

Figure 2.3 Integrative Model (Zahra & Pearce II 1989, p. 305)



The model suggests that the impact of boards on company performance can link both directly and indirectly. The direct link is through the association between board attributes (i.e. composition influences characteristics, which in turn influences structure etc.) and company performance. Zahra and Pearce II (1989) acknowledged at the time that most empirical studies have sought to establish a direct link, but suggested an indirect link via board roles to take into account the effective execution of directors' roles.

1990 to 2000

During the early 1990s, institutions such as public pension funds and institutional investors called for board reforms (Useem, Bowman, Myatt, & Irvine, 1993). The literature acknowledges that theoretical approaches such as institutional investor control (Useem et al., 1993), shareholder activist (Mizruchi, 1983), agency theory (Fama & Jensen, 1983), and resource dependence theory (Pfeffer & Salancik, 1978) addressed aspects of the nature and functioning of the board and assisted in reform efforts

(Johnson et al., 1996). Board composition was a frequent research focus (85% of 134 studies reviewed from this period).

Prior to the turn-of-the-century, and having generated considerable attention, research on boards of directors still provided little consensus as to the specific configuration of an effective corporate board (Johnson et al., 1996). From a management, financial, and sociological perspective, Johnson et al. (1996) state that the literature "does not provide a vehicle for sustaining strong consensus across the subsets of empirical research. More commonly, findings are inconsistent and where there may be consistency, associations are modest" (p. 429). In support, research on boards of directors from a managerial and organisational perspective is weak and ambiguous (Dalton et al., 1998), and models and theory needed to be critically questioned (Forbes, 1999; Huse, 1998; Pettigrew, 1992). Finkelstein and Mooney (2003) suggested that researchers needed to be willing and ready to explore new and alternative directions.

2000 to Current

By the early 2000s, the empirical research on boards and firm performance had left us no better informed (Daily, Dalton, & Cannella Jr., 2003; Finkelstein & Mooney, 2003). A sorting taxonomy of research in the US and in international academic journals explored alternative research directions and labelled four groups, described as (Gabrielsson & Huse, 2004):

- Input Output Studies: Characterised by the Lamp and Hammer syndrome; 'usual suspects' input-output studies are by far the largest contribution of the four groups. Research questions look to find the optimal balance in board size, structure, shareholding, and duality (Gabrielsson & Huse, 2004).

- Contingency Studies: Contingency or contextual studies identify with strategic adaptation in internal and external environments (Grundei & Talaulicar, 2002; Westhead, 1999), regulation and interdependent elements (Coles, McWilliams, & Sen, 2001), and stakeholder power

(Huse & Rindova, 2001) in its research stream. Conclusions drawn from contingency studies are that the roles of boards vary depending on the firm's internal and external context.

- Behavioural Studies: Behavioural studies explore processes, decision-making, and interactions inside and outside of the boardroom. Divided into two subgroups, the first studies identify with working structures and processes in and around the boardroom that split board structure and firm performance links in intermediate steps, predicting an impact on board efficiency. The second subgroup focuses on behaviours, decisions, and activities in and around the boardroom more directly (Gabrielsson & Huse, 2004).

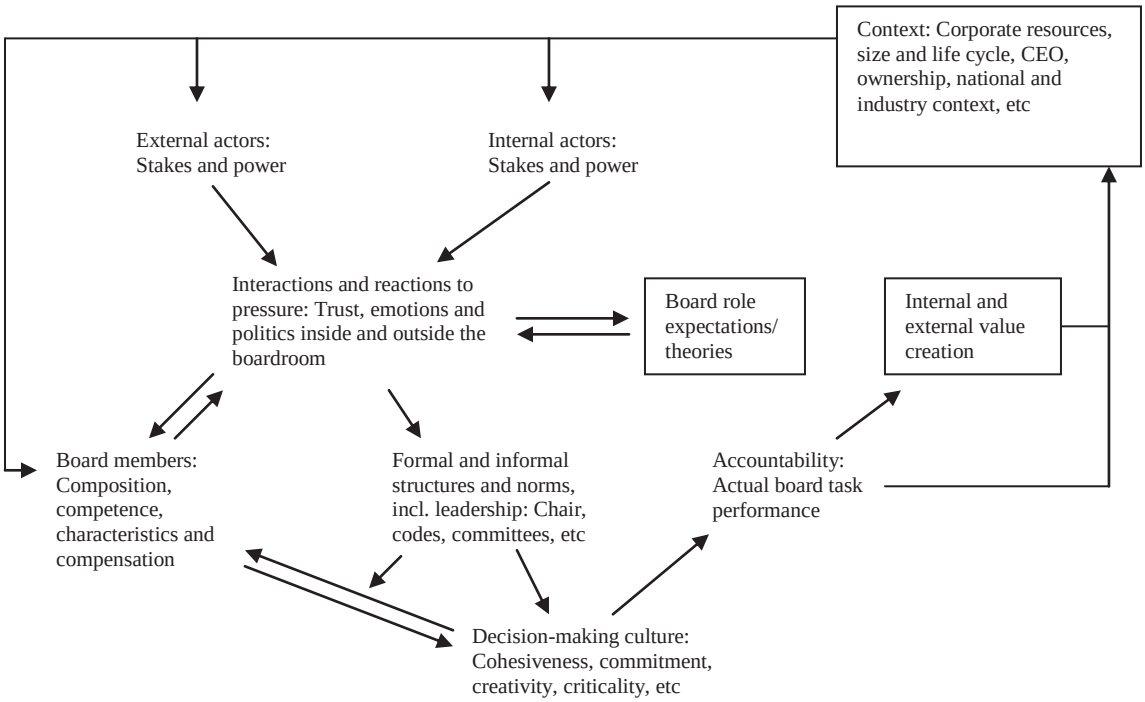
- Evolutionary Studies: The evolutionary perspective compares and contrasts longitudinal data to better understand changes in board dynamics and the development of relationships with internal and external stakeholders (Christensen & Westenholz, 1999; Pye, 2002).

By 2005, in an attempt to draw conclusions with a substantial body of board structure and firm performance, empirical studies yielded disparate findings and researchers adopted an analytical technique referred to as meta-analysis, but to no avail (Dalton & Dalton, 2005). An earlier meta-analysis study found a greater presence of outside directors associated with higher performance, but also a greater presence of insiders, suggesting the existence of a curvilinear homogeneity effect (Wagner III, Stimpert, & Fubara, 1998). Another study found that not only are inside, outside, and affiliated directors not associated with higher or lower firm financial performance, but also found no evidence of a systematic relationship between board composition and firm performance (Dalton et al., 1998). This led to the conclusion that board structure must be accompanied by theoretical pluralism, as well as a greater understanding of board process and board efficiency (Dalton & Dalton, 2005; Huse, 2005; Roberts et al., 2005).

By the mid-2000s, with the evolution of boards and governance research, it had become evident that there was a need for an expanded and alternative framework (Roberts et al., 2005). The research on boards and corporate performance fortresses (contentious publish or perish research drive (Huse, 2000), the focus on the 'usual suspects' (Finkelstein & Mooney, 2003) with easily available data

(lamp syndrome), and accepted and easy to use methods (hammer syndrome) (Gabrielsson & Huse, 2004) needed to be dismantled (Daily et al., 2003). Huse (2005) offered an extended framework, using a contingency and integrated theories approach, to open the black box of actual board behaviour (refer to Figure 2.4). The framework is centred on creating board accountability where pluralistic board theories create board role expectations. The contingencies consider context and actors (internal, external, and board members) and integrate board role theories, which link to board role expectations and thus, define accountability. Board process theories (grouped into the three subcategories: interactions and reactions to pressure; formal and informal structures; and decision-making culture) help understand actual board behaviour.

Figure 2.4 An Agenda for Black Box Research on Boards (Huse 2005, p. S67)

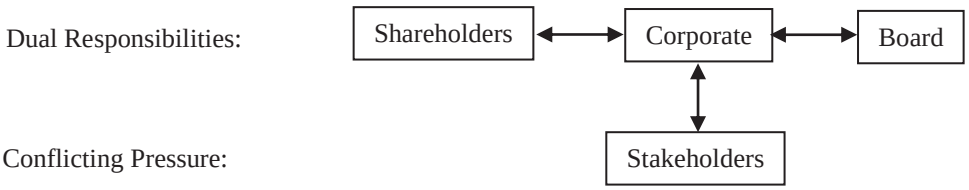


2.1.4 Board Review Conclusion

Lawler et al. (2002) note that as the capabilities of many boards have increased over the past few decades, they have struggled to evolve from being relatively ineffectual and manipulated by management to becoming strategic resources that can provide advice and exercise effective

independent oversight to ensure that firms stay focused on creating value. However, the demands on boards have been growing at an even more rapid rate. It is important not to overestimate what boards can achieve as they remain, by necessity, relatively removed from the running of a business. The multiple tasks, as well as the practical issues, shape the boards' roles and responsibilities, as well as what they are capable of doing. They have legal responsibilities, responsibilities to shareholders and to communities, and to members of the organisation (refer to Figure 2.5). The dilemma is that all of these groups put pressure on boards to engage in somewhat different activities.

Figure 2.5 Board Responsibilities



Many of the changes that are occurring in the business environment and the failures of board oversight are redefining the roles and activities of boards in ways that raise important questions about board effectiveness (Rankin, Windsor, & Wahyuni, 2011). In order to be more effective, it is important for boards to identify with these changes (Lawler et al., 2002, p. 310):

- An increase in the volume of corporate mergers and acquisitions and the accelerating pace and uncertainty of competition in the emerging global economy dictates that boards need to forge strategic alliances and partnerships. This accompanies the need for careful due diligence.

- The increasing public scrutiny of financial reporting in the wake of several high-profile corporate failures.

- The greater attention focused on corporate governance by institutional investors who are growing less patient with underperforming companies and weak inactive boards.

- The accelerating turnover rate of CEOs, placing pressure on boards to be far more proactive in planning for management succession.

The focus on board processes is grounded in agency theory, which addresses inefficiencies that arise from the separation of companies' ownership and control (Berle & Means, 1968; Eisenhardt, 1989; Fama & Jensen, 1983; Jensen & Meckling, 1976; Shleifer & Vishny, 1997a). The seminal work suggests that managers do not have sufficient equity in the firms they manage to give them the incentive to turn their full attention to profit maximisation. Instead, managers may pursue self-interested initiatives at the expense of shareholders. One monitoring mechanism that may temper that tendency is oversight by the board of *directors.* This oversight, or control function, of a board is often described as the most critical of *directors'* roles (Fama, 1980; Mizruchi, 1983; Zahra & Pearce II, 1989).

2.1.5 Corporate Governance Models

Research and reviews to date of corporate governance (Hawley, 1996; Keasey, Thompson, & Wright, 1997; Shleifer & Vishny, 1997b; Turnbull, 1997) suggest four schools of thought or models: principal agent or finance model, myopic market model, the abuse of executive power model, and the stakeholder model. Focusing on shareholder rights, the dominant model in the late 20th century is the finance view concerned with the universal agency theory problem (Shleifer & Vishny, 1997b). The principal agent or finance model values the mechanism of market governance, while the other three rely on non-market measures, such as shareholder loyalty, institutional monitoring, director empowerment, and stakeholder participation (Letza et al., 2004). Letza et al. (2004) note current perspectives on corporate governance as being categorised into two contrasting paradigms: shareholding and stake-holding. This research looks to better understand the shareholding paradigm and the finance model, incorporating markets and value.

2.2 BOARDS AND STRATEGY

Boards of directors have come under increasing scrutiny in the wake of serious corporate frauds and

failures. Stiles (2001) offers an empirical examination on the impact of boards of directors on strategy. Showing support for a number of theoretical frameworks, the examination suggests that a multiple perspective is required to fully understand the nature of the boards' strategic activity. Agency, stewardship, and resource dependence theories place a premium on the board's strategic contribution, and view the board as strategically active. Managerial hegemony theory describes the board as a de-jure legal fiction dominated by management and strategically ineffective, adopting a mere rubber-stamping function.

While the underlying concept of strategy is a deliberate formal planning process, Stiles (2001) supports the view that strategies are emergent (Mintzberg & Waters, 1985) and boards of directors are involved in both deliberate and emergent models of strategy. Stiles (2001) also identifies with the major role board power plays in strategic decision-making. Board power is inherently situational, dynamic, and non-transferable (McNulty, 1998). It is derived from structural factors which are based on formal authority positions, legislative right, control over rewards and sanctions, and forms of relations, such as abilities, personnel prestige, or status power. In addition, strategic decisions are by nature uncertain and laden with ambiguity, leaving space for the exercise of power (Finkelstein, 1992).

Boards ensure companies maintain focus and do not stray too far from the strategic framework in their gatekeeper, confidence builder, and selection of directors and CEO roles. As gatekeepers, boards ensure that the concept of strategy outlined by the board is matched by strategic behaviour at operational levels (Burgelman, 1983). Stiles (2001) finds evidence that scrutinising strategic proposals, making judgements, and setting tolerant standards encourages confidence and innovation. The study identifies with strategic content and context that impacts the process of strategy and are characterised as:

- Business Definition: factors that include industry sector, size of the firm, capabilities of its workforce, strength of competition, and level of technology.

- Corporate level strategy: where boards are expected to make a contribution.

- Strategic activity occurs at multiple levels within the firm.
- Establishing the strategic boundaries of the organisation.
- The determination of corporate objective setting in terms of business portfolio and resource allocation derives its content chiefly through the deliberations of the executive committee.
- Boundary spanning: where directors use their access to external information in strategic discussion and as a result, reduce environmental uncertainty. It could be construed as involving non-executives in the strategic arena.

2.3 STRATEGY AND MANAGEMENT CONTROL SYSTEMS (MCS)

Langfield-Smith (1997) reviews the relationship between MCS and strategy and offers a three dimensional approach (refer to Figure 2.6), which considers the changing domain of MCS. By introducing terminologies and frameworks (strategic typology, strategic mission, and strategic positioning) from the strategic literature, Langfield-Smith (1997) then proposes a strategic configuration (refer to Figure 2.7).

Figure 2.6 Strategy Dimensions (Langfield-Smith 1997, p. 212)

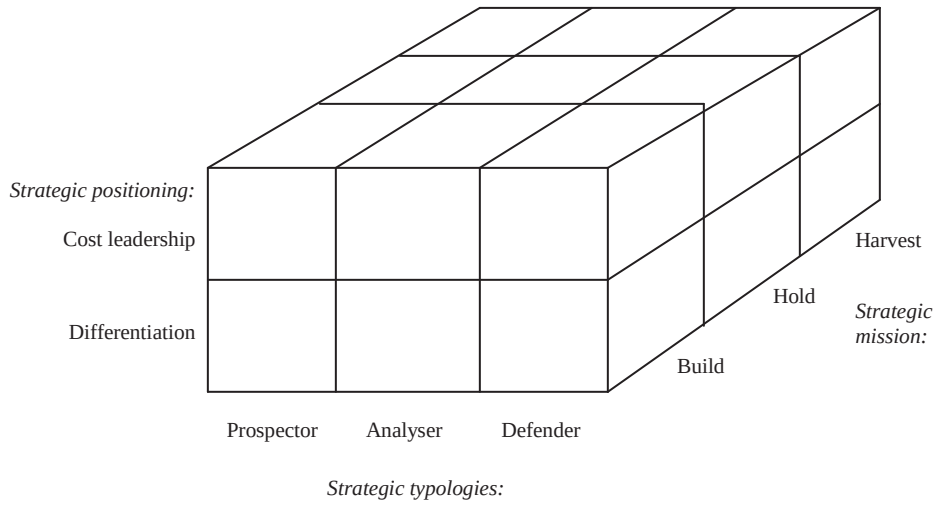
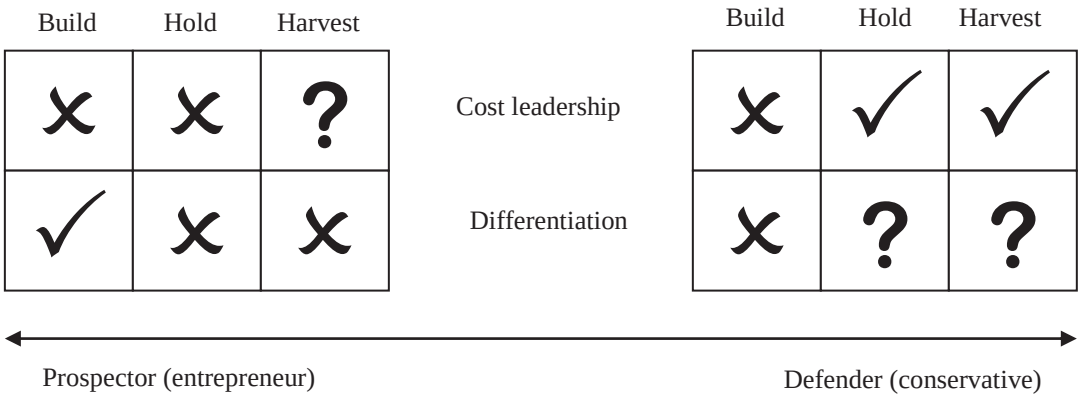


Figure 2.7 MCS and Strategy Configuration (Langfield-Smith 1997, p. 213)



Prospectors compete via differentiation and pursue a build mission, and defenders pursue cost leadership with hold and harvest missions, leading to two approaches of performance evaluation. Objective performance evaluation supports defender strategies, while prospectors rely on subjective (behaviour controls) performance evaluations.

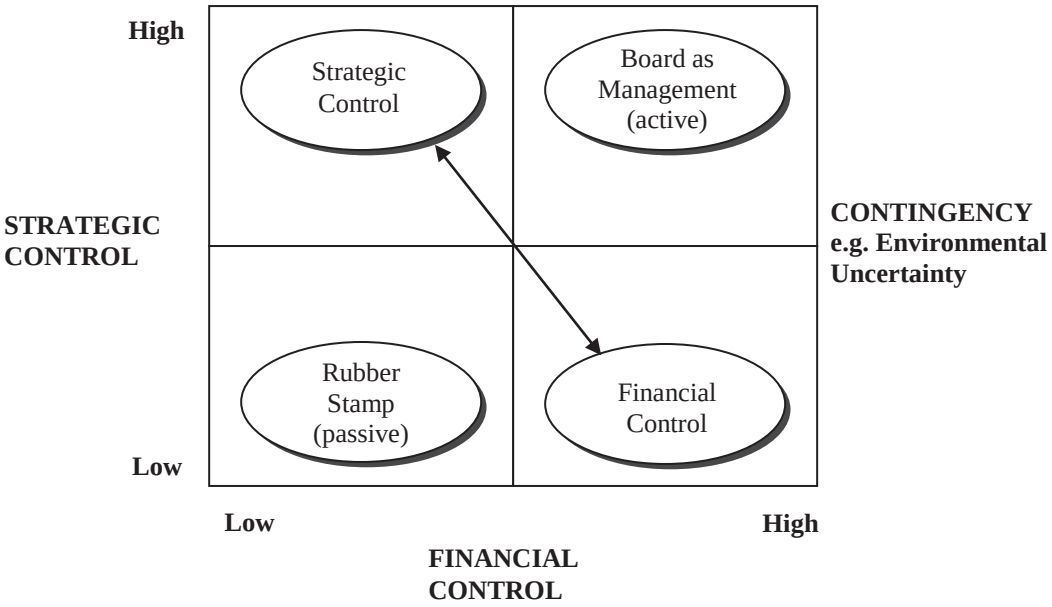
2.4 BOARDS AND INFORMATION

A literature search in Business Source Complete of the Ebsco Megafile Complete database titled ‘boards,’ ‘information,’ and ‘performance’ revealed no studies. As a result, in the context of this study, the literature is reviewed from both the board’s role and the information role perspective.

2.4.1 Board Role Perspective

A review of the literature is conducted in context of the Hendry and Kiel (2004) typology (refer to Figure 2.8), which provides a framework of the board’s role in strategy. More specifically, the typology suggests that boards take a financial and/or strategic control role in strategy.

Figure 2.8 Board Control Role Typology (Hendry & Kiel 2004, p. 512)



An initial search on board role literature found 117 studies. A sorting process found 45 of the 117 studies considered the board's financial and strategic control role. In addition, the sorting process also considered the relevance of information required by the board, given the role and context or reason for each of the 45 studies (refer to Tables 2.1A and 2.1B). The 45 studies provide useful insight into the board's information requirements given their financial (FC in the table) and/or strategic (SC in the table) control role. Eighty-six percent are considered a strategic control role and 55% a financial control role. This is consistent with the strategic role shift in the last 20 years (Hendry & Kiel, 2004).

Table 2.1A Summary of the Strategic/Financial Control Role Literature Review

Hendry and Keil Typology	No of studies	% Contribution
Strategic and Financial Control	19	42%
Strategic Control	20	44%
Financial Control	6	13%
Total	45	

Table 2.1B Strategic/Financial Control Role Literature Review

Record	Author	Year	Role	Context/Reason (cause)	Information Requirement
1	Sheehan	2009	Risk/reward identification and selection	Organisational risk	SC
2	Melkumov	2009	Internal and external	Corporate governance	SC and FC
4	Andres and Vallelado	2008	Banking governance	Corporate governance (composition/size), organisational performance (banks)	SC and FC
8	Lee	2008	Supervision in risk management	Credit crisis	FC
12	Fernandes	2008	Independents not effective	Agency theory problem (align share holder management)	
15	Roach	2007	Compliance and ethics	Criminal violations	SC
16	Williams	2007	Information security	Business assets	SC
17	Ferris and Yan	2007	Mutual fund governance	Fund scandals	FC
19	Cohen et al.	2007	Monitoring vs. strategic	Audit assessment decisions (risk)	SC and FC
20	Fields	2007	Planning and implementing	Organisational change	SC and FC
21	Kakabadse	2007	Governance due diligence/financial and competitive strength	Demographic pursuit	SC and FC
22	Glaser	2007	IT agendas	Implementing strategy	FC
24	van den Heuvel et al.	2006	Control and service	SME	SC and FC
36	Long et al.	2005	Unlisted company: Strategic development/overall board control. Listed company: Monitoring and management	Listed vs. unlisted companies	SC and FC
37	van den Berghe et al.	2005	Vigilant monitoring	Delegation policy	FC
38	Jonsson	2005	Changing roles as circumstances change	Study (Icelandic)	SC and FC
41	Obeng and Ugboro	2005	Decision-making (strategic)	Study (transit boards)	SC
43	Kula	2005	Control/service/resource acquisition	Firm performance (Turkish SME)	SC and FC
44	Hass and Pryor	2005	Corporate renewal	Reduce corporate failure	SC
45		2005	Strategic direction	Case study/research review	SC
47	Hendry and Kiel	2004	Strategic role	Theory perspectives	SC
48	Stephens et al.	2004	Control/service/resource dependence	Organisational commitment, corporate governance	SC and FC
49	Iecovich	2004	Decision-making	Non-profit organisations	SC and FC
50	Nadler	2004	Strategic engagement	Framework to engage	SC
51	Allio	2004	Strategy and leadership	Interviews	SC and FC
52	Jonk and Schaap	2004	Strategy development	Framework	SC
53	Mordaunt and Cornforth	2004	Turnaround (non-profit)	Non-profit failure	SC
57	Goldschmidt	2004	Preventing economic crime	Abuse of companies	SC
60	Cornell and Doyle	2004	Care and loyalty	Compliance matters/programs	SC and FC
62	Xie et al.	2003	Earnings management	Financial sophistication	FC

66	Ingley and Van der Walt	2001	Giving direction and strategic implementation	Governance challenges/proposed framework	SC and FC
67	Inglis and Weaver	2000	Strategic activity/resource planning operation	Not for profit budget agendas	SC and FC
69	Oliver	2000	Strategy and planning	Driver seat or rubber stamp	SC
72	Hillman et al.	2000	Resource dependence	Environmental change	SC
74	Myllys	1999	Managing change	Survival	SC
82	Goold	1996	Corporate governance and strategy	"Cadbury"	SC
87	Gopinath and Siciliano	1994	Strategy	Theories perspective	SC
89	Sadtler	1993	Strategy more than command and control	Large and complex organisations	SC and FC
97	Millich	1988	Merger agreements	Corporate law	SC
98	Pinnell	1986	Planning (strategy formulating and implementation/monitoring)	Stage perspective	SC and FC
101	Wilider	1985	Technology push	Market change innovation	SC
104	Molz	1985	Not as trustees for S/H. Exercise control/economic decisions	Focus	SC and FC
106	Tashakori et al	1983	Strategic planning	Examine the current status	SC
112	Boulton	1978	Information needs	Increases dramatically with increased board activity	FC
114	Boulton	1978	"Socially oriented"	Public and government regulation	SC

2.4.2 Information Role Perspective

Similar to the board role perspective, the literature is reviewed from an information role perspective. An initial search on information role literature found 458 studies of which 384 are in the general information category and 74 are in the specific information category (accounting and finance information) (refer to Table 2.2A). A sorting process then required the reviewed studies to offer useful insight into this study's information objectives namely the board's decision-making; monitoring and control roles; firm performance, and strategy.

The sorting process of the 384 studies in the general information category considered each study's findings, type and use of information; the context; and the responsibility level the information was aimed at (refer to Table 2.2B). Seventy-six of the 384 studies, providing useful insight into the role of information, are summarised into the eight general categories (refer to Table 2.2A). The sorting process suggests that the literature, offering studies from an information perspective, could be seen as relevant and useful to the type of information boards require. However, the "level aimed at" analysis does not include boards or directors. Similarly, 32 out of the 74 studies from the specific information

category (refer to Table 2.2C) offering useful insight into decision-making and monitoring of performance from an accounting and finance perspective, did not include boards or directors.

Table 2.2A Summary of the Information Role Literature Review

Category	General Information Category	Ref Code	Surveyed	Useful	% contributed
1	Decision-making	7	97	10	10%
2	Performance monitoring	5	42	1	2%
3	Financial performance	8	43	5	12%
4	Decision-making and performance	3	25	9	36%
5	Firm performance	6	58	7	12%
6	Strategy	4	62	18	29%
7	Management	2	30	12	40%
8	Management decision-making	1	27	14	52%
		Total	384	**76**	20%
	Specific Information Category				
9	Performance: Finance	10	31	18	58%
10	Performance: Accounting	9	43	14	33%
		Total	74	32	43%

Table 2.2B General Information Category Review

Record	Author	Year	Findings	Type of Information	Information Used For	Study Context	Level Aimed At
1.01	Eldenburg and Krishnan	2008	Differences in use for information	Accounting information	Improve performance	Ownership structure (private, government, not-for-profit)	CEOs
1.02	Inglis	2009	Information assists in operational level decisions	Management accounting information	Interface market orientation in product level decisions	Product level/Operations	Management
1.03	Bendoly and Swink	2007	Should consider a set of behavioural issues in future information processing	Project management information	Project management performance	Project manager	Management
1.04	Boone et al.	2005	Information acquisition mediates locus of control	Team information acquisition	Mediation	Business simulation study	Management teams
1.05	Fila	2005	Supply chain partnerships lead to increased information flows	Consumer demand information	Supply chain information sharing	Decentralised decision-making information asymmetry	Supply chain management
1.06	Frishammar and Sven	2005	Decision-making based on information from the industry environment correlated significantly with innovation performance	External information	Innovative performance	Innovative management firms	Management
1.07	Arpon	2005	Negative information not as damaging in operations with strong reputations	Positive and negative new information about the organisation	Corporate social performance	Corporate social performance attitudes toward organisation	Organisational managers
1.08	Moynihan and Ingraham	2004	The use of performance information matters in leadership and decision-making	Performance information	Decision-making. Leadership managing for results	Public sector leadership	Public sector management
1.10	Preuss	2003	Quality of information affects organisational performance	Equivocal information (several meanings)	Mediating role of information quality/performance quality	High performance work systems and organisational outcomes	Operations (nurses)
1.11	Wijnberg et al.	2002	New technology increases employees' awareness of firm performance objectives	Upstream and downstream flows of information	Performance objective awareness	Introducing new information technology in financial sectors	Lower organisational levels
1.15	Swink et al.	1999	Information characteristics have an impact on decision performance	Geographic information characteristics	Decision support/performance	Problem complexities in geographical information systems	Decision-making level
1.18	Dumond	1994	Access to external information impacts on decisions, little effect on comfort level	External information	Decision-making. Comfort levels	Managing a function/complex boundary spanning operation	Individuals

1.23	Lucas and Nielsen	1980	Support for "made of information presentation" and user background on learning	Experimental/game relevant information	Impact of the mode of information presentation on performance	Game/experiment	Management
1.25	Schroeder and Benbasat	1975	Result was contrary to the belief that more and better information produced better decisions	Information characteristics (age, frequency, number)	Decision of management information systems	Experiment	Decision makers
2.01	Hong Chung et al.	2006	Multi-national corporations management place great emphasis on financial metrics	Key performance metrics	Information management and multi-national corporations' nationality	Multi-national corporations	Top managers
2.02	Neuschel and McKinsey	1976	Guidelines for information structures	Information characteristics (quality, relevance and timeliness)	Quality of management and consequently performance of corporation	Performance of corporation	Management
2.03	Dew and Gee	1970	Essential for information to be relevant and adequate	Management control information	Provision of information for corporate control	Corporate control	Management
2.04	Brown et al.	2009	Questions the power of commodified information to mobilise civil society	Commodified (make commercial) information	Voluntary reports of environmental & social performance of business worldwide	Underdeveloped base of GRI information	Worldwide corporate sustainability management
2.05	Allard et al.	2009	Significant changes in the information environment	Research and development	Production design and testing	Exploratory study in how engineers in high tech firms use information	Engineers
2.07	Michael	2007	Investment in information processing/computer technology/significantly complements an unrelated diversification strategy	Organisation performance	Information processing/performance effects	Unrelated diversification strategies	Management
2.15	Messner	2004	Poor customer information leads to wasted money, also flawed corporate strategy because of KPIs	Quality customer information	Marketing projects	Importance of quality customer information	Marketing management
2.17	Lemieux	2004	2 approaches to managing information risks: survey environments and analyse the organisation requirements for records and information	Risk information	Risk avoidance and control	Organisations records and information's	Management
2.18	Cao and Schniederjans	2004	Alignment of operations strategy, business environment and information strategy determining e-commerce performance success	E-commerce performance	Integrating operations strategy and information strategy in an e-commerce setting	E-commerce operations and strategy	Corporate executives
2.19	Buyukozkan	2004	Suggest and information based responsive organisation network framework	Supporting information and knowledge management	Corporate responsive and enhanced performance	Operations functions and customer supplier relationships changing environments	Operations management

2.27	Ward	1987	Corporate strategy analysis and formulation can be used to determine how information should be managed to gain maximum business benefit	Cost performance, technology	Restructuring, re-designing the balance of power, leveraging and competitive strategy	Information revelation	Management
2.28	Bell	1984	When the link between organisational actions and performance is not understood, analysts give more weighting to non-numeric information in evaluation	Financial accounting reports (non and numeric)	Weighting placed on decisions give presentation	Presentation of company information, research and development vs manufacturing	Financial analysts
3.04	Demirhan et al.	2005/2006	First entrant over-invests in price sensitive market and under-invests in quality sensitive market as uncertainty increases	Competitive market information	Improve the quality and cost of product and services	Early/late entrance investment in information (IT) in quality vs price markets	Management
3.07	Souchon et al.	2004	Positive affect on the use of information on responsiveness which in turn found positively related to organisational performance	Responsiveness and decision-making	Use-performance relationship	Market information in decision-making in competitive firms	Management
3.08	Ferrer and Ketzenberg	2004	Yield information is valuable	Remanufacturing yields and loss supplier lead times	More timely and accurate information leads to product performance	Remanufacturing facilities	Manufacturing operations
3.09	Angulo et al.	2004	Identify factors to be overcome in SCM information sharing	Supply chain information (ARP/UMI)	Match supply and demand effectively	Multi-firm supply chain partnership	Inventory management
3.10	Argiles and Slof	2003	Farmers using accounting information for decision-making perform financially better	Accounting information	Financial performance	Producing accounting information voluntarily when no formal obligation	Farmers
3.12	Souchon et al.	2003	Effect depends on type of information use and mode of information acquisition	Export and content specific types of export	Export decision-making, export performance	International exporting firms (5 countries)	Export management
3.18	Seidmann and Sundararajan	1997	Concentrate information (IT) on enhancing productivity and communications in competitive markets and concentrate decision authority	Economic and competitive	Decentralisation, consolidating task	Decision authority/business process re-engineering	Top management
3.20	Stank et al.	1994	Centralised firms characterised by better information support than decentralised (financial benefit, enhances flexibility, and responsiveness)	Interacting functional areas	Centralised/decentralised (logistic integration)	Organisational structure	Managers
3.22	Lederer and Smith	1988/1989	Summary data served Heuristic planners better. Detailed data served Analytical Planners.	Different aggregate levels of information	Identify decision-making differences	Pattern of decision-making in product distribution	Managers
4.01	Liu and Anbumozhi	2009	The better the company's economic performance, the more EID	EID - Environmental information disclosure	Environmental sensitivity concerns	Chinese listed company	Governments
4.02	Massa and Rehman	2008	Exploiting privileged inside information	Informal information flows	Affiliated bank borrowing	Financial conglomerates, mutual funds and bank relationships	Fund managers

4.04	Speier et al.	2008	Offers framework in understanding the link between information integration and supply chain performance	Strategy, structure and performance	Integrated information support, multiple organisation supply chain capabilities	21st century supply chains	Supply chain management
4.09	Hyvonen	2007	Contemporary MAS and advanced information (IT) are related to high customer performance	Advanced information	Improve customer performance	MAS, customer strategy, and performance	Management
4.13	Citrin et al.	2007	Specific information use, alignment with strategy	New products in firm strategic environment	Impact of firm strategic type (prospector/defender/analyser) on new product outcomes	New product outcomes	Top management, strategic management
4.15	Burney and Widener	2007	Positively affects performance through JRI	Job relevant information (JRI)	Linking firm performance measures to firm strategy	HIR	Managers
4.16	Li et al.	2006	Near complete information sharing has better performance in volatile market conditions	Information exchange in supply chain	Effect of information sharing in stable and volatile market conditions	Inter-organisational information sharing	Supply chain managers
4.19	Bourlakis	2006	Successful integration of information functions and logistics offers competitive advantage	Retailers' distribution and operational performance (logistic strategies)	Integrating and linking logistic strategies to retail firms	Logistics and retail	Distribution management
4.22	Ferrante	2006	Shared accounting information impacts worker trust in management and performance	Accounting information	Trust in management and performance	Large US firm	Workers
4.23	Reddy	2006	Past information investment (IT) negatively affect mergers and acquisition in success and impede new product/services development	Corporate strategies	Information investment	Competitive advantage	Corporate
4.25	Hemsworth et al.	2005	Information practises have a direct impact on purchasing performance	Purchasing practises	Purchasing performance	Purchasing functions	Manufacturing management
4.27	Pollalis	2003	Consistency between information (IS) and strategic integration improves overall firm performance	Operations, product, strategy, distribution, customer service	Strategic alignment	Information intensive organisations	Corporate executives
4.28	McNamee et al.	2003	Comprehensive bench-marking data can close the information gap small firms have over large firms and boost performance	Bench-marking	Bench-marking	SME	SME owners
4.37	Forster and Regan	2001	Used electronic information integration as a strategy to improve performance is dependent/limited by inter-organisational task and environment dynamics	Supply chain	Electronic information integration	International air cargo industry	Air cargo management
4.41	Fangruo	1999	Manage as cost centres without compromising system-wide performance (accounting investment and customer demand information)	Local accounting inventory (levels) information	Information delays	Decentralised supply chains	Management
4.50	Stank et al.	1996	Information exchange and seller performance are positively related	Information exchange	Flow of information and seller performance	Buyers and sellers	Export managers

4.51	Henderson and Fredrickson	1996	CEO comparison higher in high information-processing demand firms (i.e. Decentralised)	Information processing demand	Organisational structure	Compensation	CEOs
4.58	Rasch and Hansen	1993	The sharing of even modest subsets of information produce superior performance	Subsets of information	EPI	Information sharing	Firm relevant trading partners
5.01	Chandra and Nayar	2008	Lenders have private information on post-issue debt performance. Not so with equity investors	Overly optimistic information	Investment decisions	Private placement of non-bank debt	Equity investors
6.09	Stone et al.	2007	Information quality (and others) mediates individual performance	Marketing	Firm marketing performance	Firm marketing	Marketing executives
6.11	Griffis et al.	2007	Develops framework to allow management to assess unique measurement needs	General	Performance measurement	Information needs of the firm	Management
6.18	Shin	2006	Sheds light on IS in diversification and financial performance	Information benefits in diversifying	IS in diversified firms and financial performance	Diversified firms	Business unit managers
6.34	Griffis et al.	2004	Find 3 firms of disconnect	Reporting	Align goals, performance and information	Firms goals and objectives (logistic systems)	Management
6.38	Toften and Olsen	2003	Export market knowledge provides a deeper understanding of export market information use and export performance	Export market	Export performance	International markets	Export marketers
6.44	Raju and Roy	2000	Information is more valuable in competitive industries. More precise information has a greater impact on profits	Product market	Firm and industry characteristics moderating the effect of market information on firm profits	Game theoretic model	Marketers
6.57	Morishima	1991	Positive association of information sharing with profitability and productivity. Negative with labour costs	Private business information	Sharing information and firm performance	Sharing private business information with unions and employees (Japan)	Management
7.02	Ardren	2008	Life cycle approach and address risks	Asset management	Acquisitions, operations, maintenance, and disposal of assets	Infrastructure projects	Asset managers
7.09	Bendoly and Swink	2007	Extending existing information processing theory	Resource availability, scheduling options, costs and benefits	Project management, performance	Controlled experiment simulating a multi-party project management environment	Project management
7.10	Dearstyne	2007	9/11 NY fire department case study providing evidence of insights into the optimal use of information by emergency services departments	Crisis/emergency coordination/communications	Crisis/emergency management	9-Nov	Crisis managers (commanders)
7.11	Yu-Lee et al.	2006	ABC helps and hinders decisions - authors offer an effective use of ABC information	Cost related (ABC)	Profit enhancing decisions, financial performance	Too much information (ABC)	Operational managers

7.21	Chinander and Schweitzer	2003	Authors identify an input bias (systematic misuse of input information) in judgement of outcome quality. Has broad implications on manager judgement and decision-making	Input measures (time spent)	Outcome assessments	Performance reviews	Management
7.23	Borgatti and Cross	2003	Results indicate strong support for the seeking of information from "other people" function/model	Information from "other people"	Organisational learning besides declaration and procedural knowledge	Organisational learning in social network information	Management
7.41	Anand and Mendelson	1997	Results qualify value of co-locating the decision rights with specific knowledge	Alternative coordination structures and decisions	Decision authority in decentralised/centralised organisations and performance	Organisational structure	Management
7.75	Dye	1983	Alternative sorts of information (auditing a manager's account) can be used as an alternative to communication	Post decision information	Determining/valuing management's worth	Determining compensation	Management supervisors
7.80	O'Reilly	1980	Information overload is associated with higher satisfaction and lower performance of decision makers	Too much or too little information	Decision-maker performance	Information oveload	Management
7.92	Taylor	1975	Age was found to influence performance more than prior decision-making experience	Making decisions	Decision performance	Age and decision-making experience	Management
8.02	Barker and Aydin	2008	Centralisation inhibits information sharing. Decentralisation leads to higher levels of customer satisfaction	Information sharing	Organisational performance (decentralised/centralised)	Customer satisfaction and firm performance	Management
8.03	Lee	2008	Reveals a gap between information considered important and information considered useful (non-financial still being developed)	Important performance information (financial and non-financial)	Achieving organisational objectives	Information survey	Management
8.04	Wiersma	2008	Non-financial performance measures do not have more relative information content than lagged financial measures however there is increased IC	Relative and incremental information content	Financial and non-financial performance for future financial performance	Service industry observation	Responsible entity managers
8.09	Dikolli and Sedatole	2007	The refinements suggested increased ROA from 52% to 78% suggesting important new insights	Information content (non-financial performance measures) NFPMs	Future financial performance	Internet retailers	Management
8.20	Engel et al.	2003	Accounting information receives greater weighting (market-based performance measures less) in turnover decisions when accounting information is precise and sensitive	Precise and more sensitive information	Firm level performance, CEO turnover	Optimal contracts, agency theory	CEO, top management

Table 2.2C Specific Information Category Review

Record	Role	Type	Use
9.01	Prediction	Financial statement information	Book return on owners' equity
9.02	Bench-marking	Management account information	Performance measurement
9.03	Audit judgment	Audit processing information	Judgment reference
9.04	Benefits of alternative income statement format	Matrix income statement format	Performance reporting
9.05	Government organisation	Citizenship vs customer perspectives	Performance information
9.06	Interface/integrate	Management accounting, resource cost, customer needs	Product level decisions
9.07	Impact of workers trust	Shared account information	Management performance
9.08	Provide relevant information	Account information for investment decision-making	Residual income model
9.09	Competitive disadvantage	Segmented information	Segmented reports (ASB 22)
9.10	Executive bonus plans	Account rated returns vs earnings alone	Executive performance evaluation
9.11	Information content in impairment test	Goodwill accounting	Discrimination viable investment projects
9.16	Measuring resources	Information assets (IP)	Knowledge-based company performance
9.19	Management accounting information improves ability to develop relevant information	Task vs domain experience	Provide high quality information advice
9.26	Value relevance of financial and non-financial information	Non-financial (effective) financial only when combined	Share valuation (communications industry)
10.01	Stock splits	Information content	Operational performance
10.02	Option markets	Information content	Stock/share returns
10.03	Mutual funds	Public and private	Fund manager performance
10.06	Inflation	Forecast	Forecast performance
10.07	Security breaches	Event study	Abnormal returns performance
10.08	Earnings pre-announcements	Information content	Earnings performance
10.10	Inflation	Monetary indicators	Euro area (Division M3 M1)
10.11	Macro economy	Forecasting horizons (market information)	Forecasting performance
10.12	Fund management	Maximum information ratios	Risk adjustment performance
10.15	Cross listing	Mexican company with USA	Financial performance
10.16	Ethics, equity, social justice	Financial information	Social score
10.18	Equity offerings	Information content	Future operations performance
10.19	Role of financial analysts	Staging information	Critic between firms and investments
10.20	Extension of CAPM	Conditioning information	Asset pricing
10.21	Foreign acquisitions	Information signalling	Stock price effects
10.22	Mutual funds	Premiums and discounts on CECFs	Future returns
10.23	Voluntary disclosure	Private information of firms	Insider trading
10.27	Review of studies	Budgetary information	Performance evaluation

2.5 OBSERVING CORPORATE PERFORMANCE

The Zahra and Pearce II (1989) seminal study offers firm financial performance as the criteria related to shareholder wealth. It refers to two financial performance measures, namely accounting performance, which includes return on assets, return on equity and dividend per share, and market-based criteria. Zahra and Pearce II (1989) also refer to systemic (focus on a firm's survival and growth) and social performance (corporate response to changing societal expectations); however, studies prior to the early 1990s, from a theoretical perspective, focus mostly on financial criteria. For example, while resource dependence theory studies include only financial performance of the organisation, and class hegemony theory includes systemic performance, accounting-based financial performance dominates these studies. The situation is the same for agency theory studies, except market-based financial performance is more prevalent. By the start of 2000 there was no consensus as to what constituted appropriate measures of corporate financial performance (Johnson et al., 1996). Studies in this period include return on assets; return on equity; and return on investment, profit margins and price earnings ratios. In addition, these measures were reported in single and multiple lagged years, adjusted for industry effects and to account for risk. Johnson et al. (1996) conclude that the lack of consensus on choice and operationalisation of dependent variables severely limits the generalisability of governance research findings (p. 430). In the same period, Wagner, Stimpert et al.'s (1998) meta analysis study, though specific to board structure, coded organisational performance according to accounting or non-accounting measures, where non-accounting performance included sales and share performance. By the mid-2000s, Dalton, Daily et al.'s (2003) meta-analysis suggests both accounting and market-based measures are relevant as a result of the differing functions in the nature of the performance measure. Essential behavioural distinctions argue accounting-based measures are subject to managerial manipulation and difficult to interpret across industry context, while market-based measures are sometimes beyond a manager's direct control.

2.6 CHAPTER SUMMARY

This chapter establishes the gap and paucity in the board literature on the role that information plays in supporting effective boards. The board role literature is reviewed from a multi-disciplined perspective, and a three period review is presented. In addition, the board and strategy and MCS and strategy literature is reviewed. A sorting process of 458 studies revealed 108 studies are seen as relevant and useful to the type of information boards require, but none included boards or directors. In addition, 45 studies are consistent with the board's strategic role shift and as such, their information requirements, over the last 20 years. Chapter 3 develops the theory and propositions.

CHAPTER 3

THEORY DEVELOPMENT AND HYPOTHESES

3.0 INTRODUCTION

There is research evidence that certain board practices are associated with board effectiveness and organisational performance (Lawler et al., 2002). Boards that have better information practises, for example having a range of indicators for organisational success and benchmarking against top performance in comparable industries, perform their roles more effectively, as evident in the firm's accounting and share market returns (Lawler et al., 2002). Most of the board's time is spent on implementing, monitoring and shaping the firm strategy (Lawler et al., 2002). There is, however, no evidence as to the nature of the information that is associated with board effectiveness and, in turn, higher organisational performance.

Research from an organisational control perspective does, however, offer theories and frameworks that identify with information attributes, the board's control role and firm strategy, which are promising in this regard. This research argues that boards are more effective in delivering better firm performance when an interaction is observed among information attributes found in Strategic Performance Measurement Systems (SPMS) (Kaplan & Norton, 1996), the firm's strategic configuration (Langfield-Smith, 1997) and the board's control role (Hendry & Kiel, 2004). This chapter develops the theory on this argument and determines the independent and dependent variables used to test this theory in Chapters 4, 5 and 6.

In determining this research's theory, three constructs (independent variables) are investigated (refer to Figure 3.5): Construct S – the firm's strategic configuration, Construct B – the board's control role type, and Construct I – the information attributes in SPMS. In addition, a Composite Index of Firm Performance (dependent variables) is determined where the firm's financial performance measures fall into two categories, accounting and shareholder returns (Cochran & Wood, 1984; Muth & Donaldson, 1998).

This chapter proceeds as follows: Section 3.1 develops the theory that determines the three constructs: S, B and I, which are the independent variables. Section 3.2 develops the theory to determine the Composite Index of Firm Performance, which is the dependent variable. Section 3.3 presents the research propositions, diagram, and hypotheses. Section 3.4 summarises the chapter.

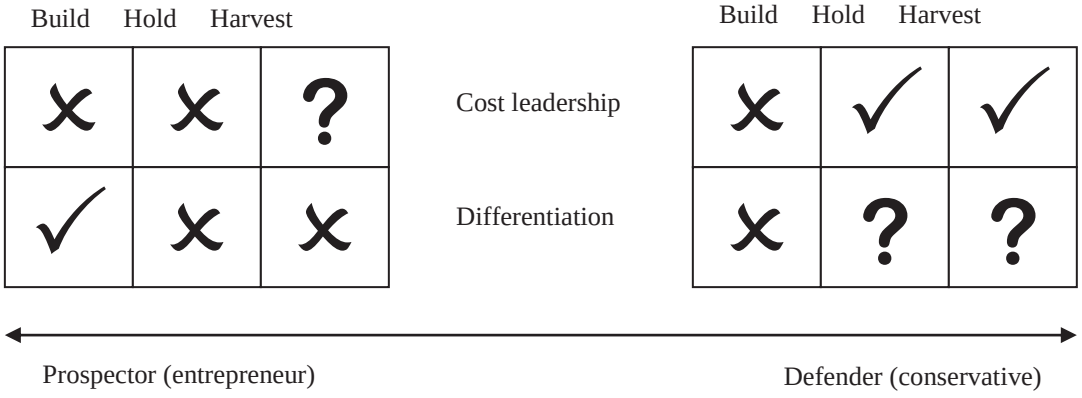
3.1 INDEPENDENT VARIABLE CONSTRUCTS

This section develops the strategy, board control role, and information constructs.

3.1.1 Strategic Configuration

Relying on the accepted position that performance measurement directs attention and motivates management to act in strategically consistent ways, Langfield-Smith (1997) proposes a Prospector (entrepreneur) and Defender (conservative) strategic dichotomy (refer to Figure 3.1).

Figure 3.1 MCS and Strategy Configuration (Langfield-Smith 1997, p. 213)



Langfield-Smith (1997) argues that prospectors compete via a differentiation strategic positioning and pursue build strategic missions, while defenders compete with cost leadership strategic positioning and hold/harvest missions. In PMS evaluation, prospectors identify with behavioural, ex-ante, and pre-implementation information characteristics, which are of a feed-forward nature and subjective (Langfield-Smith, 1997). The PMS evaluation of defenders has outcome, output, and results information characteristics, which are of a feedback nature, often financially orientated and objective. In addition, Gupta (1987) found subjective performance assessment to be consistent with a

differentiation positioning, build mission, and prospector combination, but inconsistent with cost leadership positioning.

Prospectors are described as continually searching for market opportunities and as being the creators of change and uncertainty to which their competitors must respond. The marketing and research and development functions dominate finance and production, so efficiency and profit performance are not as important as maintaining industry leadership in product innovation (Langfield-Smith, 1997).

Defenders have a narrow product range and undertake little product or market development. The functions critical for organisational success are finance, production, and engineering, with less emphasis on marketing and research and development (Langfield-Smith, 1997).

In developing Construct S, this research sees the prospector/entrepreneur and defender/conservative strategic configurations as being a dichotomous strategic choice taken by each board.

3.1.2 Board Control Role

Boards of directors are a legal requirement for incorporation, and are responsible for governance and as such, they have become the source of much research. The Economics and Finance (Hermalin & Weisbach, 2003), Management (Pye, 2001; Zahra & Pearce II, 1989), Accounting (Cravens & Wallace, 2001), and Corporate Governance (Denis, 2001; Shleifer & Vishny, 1997a) disciplines describe the impact boards have on their immediate environment. As an institution, boards of directors, inherent in the separation of ownership and control (agency theory), are an efficient form of economic organisation (Fama, 1980) and are endogenous. However, whilst formal theory on boards is quite limited, the literature has expanded as a result of empirical studies (Hermalin & Weisbach, 2003). This research seeks to understand the board's control role in relation to Management Control Systems (MCS) and strategy and as such, two arguments become evident. First, board theoretical perspectives support an active or passive board role in strategy, with the academic literature demonstrating a shift away from passive to an active role; and second, the board's control role is based on a strategic and financial control dichotomy (Hendry & Kiel, 2004).

Board Active / Passive Strategic Role

Seminal work by Zahra and Pearce II (1989) introduces an integrative model in the study of boards. Considered by many to be a good research starting point (Gabrielsson & Huse, 2004; Johnson et al., 1996), it presents four distinct theoretical perspectives that guide the roles of boards of directors: legalistic, resource dependence, class/managerial hegemony and agency theory. These perspectives draw their theoretical origins from diverse disciplines, such as sociology, corporate law, economics, finance, and organisational theory and differ meaningfully in their views of what directors do. With its theoretical origins in corporate law, the legalistic perspective is outside the boundaries of this study. However, given the emphasis and argument that the strategic role of the board contributes to the overall stewardship of the firm (Hung, 1998), the study does consider stewardship theory (Davis et al., 1997). The nature of a board's contribution and, consequently, the expectations placed upon it, means that its information requirement depends crucially on which theoretical perspective is adopted. Hendry and Kiel (2004) align the board theoretical perspectives to introduce a "two schools of thought" approach, referred to in the literature as strategic "active" and "passive" boards (Golden & Zajac, 2001). Supported by both board theory and academic literature, the passive school views boards as rubber stamps or as tools of top management whose only contribution is to satisfy the requirements of company law (Stiles, 2001). Across the continuum, the active school sees boards as independent thinkers who shape the strategic direction of their organisations (Walsh & Seward, 1990).

Board Strategic and Financial Control Role

Hendry and Kiel (2004) develop a typology for the board's control role in strategy, based on two constructs: strategic and financial (Gupta, 1987; Hitt et al., 1990) and argue that "there is a parallel between these control systems and those exercised by boards over top management" (Hendry & Kiel, 2004, p. 511). Strategic control involves behavioural and subjective assessment of strategic decisions pre-implementation. Boards that emphasise financial control favour an outcome role in strategy, setting mostly financial targets and exerting influence over management at the end of the resource allocation decision process.

Strategic control boards shape the:

1. Context of strategy by setting the conditions under which the strategy process happens in firms;

2. Content of strategy by requiring that management justify their intentions by evaluating alternatives and by continuously monitoring progress during this formulation and assessment stage; and

3. Conduct of strategy by continuously monitoring implementation and results and by making changes where appropriate.

Strategic control involves the board exerting a continuous process of formal and informal influence over management, beginning early in strategy development and involving iterative consultation from development through to implementation and evaluation.

It also involves the board evaluating management based on their strategic proposals pre-implementation, as well as on the financial results post-implementation.

Financial control boards:

1. Set financial targets only and take strategic decisions relative to these targets by approving, rejecting, or referring strategic proposals back to management;

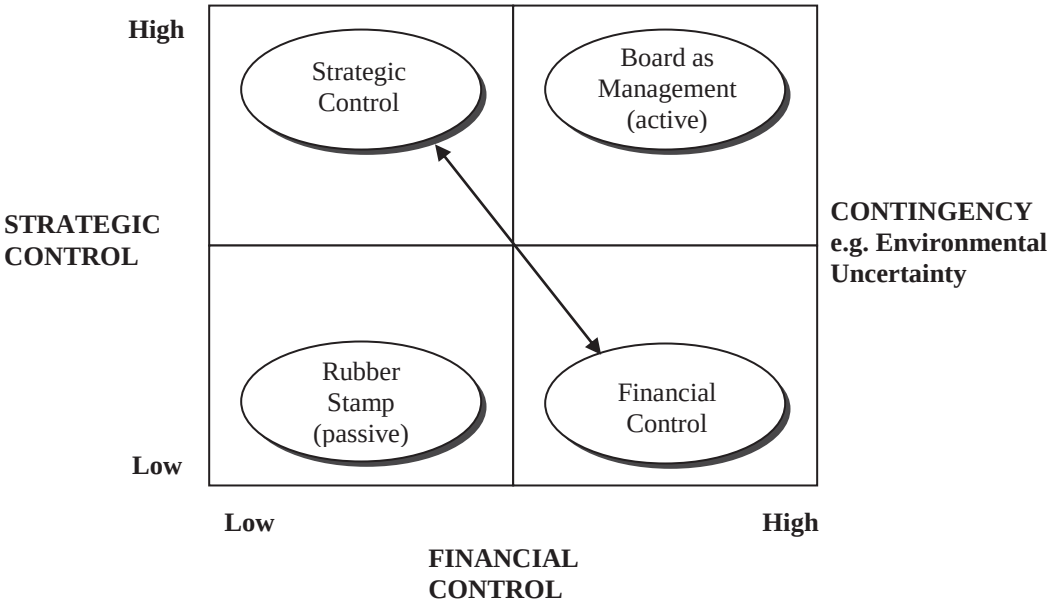
2. Exert episodic influence over management at formal board meetings and only at the end of the resource allocation decision process; and

3. Evaluate management primarily on the financial results of the firm.

To illustrate the board's control role in strategy, Hendry and Kiel (2004) develop a typology for characterising a board's control role in strategy (refer to Figure 3.2). Consistent with agency, stewardship, and resource dependent theory perspectives, both strategic and financial controls would be associated with an active board role. Conversely, neither strategic nor financial controls would be

associated with a passive board role (consistent with a managerial hegemony theory perspective). The academic literature demonstrates a shift away from a passive (rubber stamp) role to an active (board as management) role (Hendry & Kiel, 2004).

Figure 3.2 Board Control Role Typology (Hendry & Kiel 2004, p. 512)



In PMS evaluation, Hendry and Kiel (2004) define strategic control as behavioural and involving subjective assessment of strategic decisions pre-implementation and financial control as outcome and involving primarily financial performance post-implementation.

In developing Construct B, this research identifies with the board's strategic and financial control roles in firm strategy. In addition to developing Construct B, Hendry and Kiel (2004) propose that the board's relative emphasis between strategic and financial control is contingent upon three factors: environmental uncertainty, board power, and information asymmetry. Hendry and Kiel (2004) propose that high levels of environmental uncertainty and board power are positively (negatively) related to strategic control (financial control). Information asymmetry is negatively (positively) related to strategic control (financial control). Environmental uncertainty is measured using the survey questions developed by Gordon and Narayanan (1984) (refer to Appendix 3A). Board power is measured by CEO duality, relative tenure, co-opting, and outside share ownership as proposed by

Zajac and Westphal (1996). Information asymmetry is measured using the survey questions offered by Rutherford and Buchholtz (2007) (refer to Appendix 3B).

3.1.3 Information Attributes

Integrated organisational control theory and an economic control (agency theory) approach, accomplishes control through two performance evaluation types: behavioural-based and outcome-based (Eisenhardt, 1985; Ouchi, 1979). These evaluation types emphasise the information aspects of control. Behavioural control is seen as a set of rules with regards to the organisation's transformation process or task programmability (Ouchi, 1979). From an MCS and strategy point of view, they are a feed-forward or ex-ante control requiring ongoing monitoring and decisions and are subjective in nature (Langfield-Smith, 1997). Outcome control is an appropriate evaluation of performance when the organisation's goals and objectives can be clearly stated and the outcomes clearly measured (Eisenhardt, 1985). Characterised as feedback controls from an MCS and strategy point of view, they are objective in nature. They include output or results controls and are financially orientated (Langfield-Smith, 1997).

Information that easily translates into "the ongoing monitoring of a set of rules," "strategic programs of a feed-forward nature," and "low outcome measurability" is associated with strategic control in the Hendry and Kiel (2004) typology. Information of a feedback nature, which includes output or results control and where task programmability is imperfect, is associated with financial control in the Hendry and Kiel (2004) typology.

This research identifies with Information Attributes of Strategic Performance Measurement Systems (SPMS) in developing Construct I. While traditional performance measurement systems identify with past performance and comply with pre-established plans, contemporary performance measurement systems, for example, the balanced scorecard, are used as communication, information, and learning systems (Kaplan & Norton, 1996). This research identifies with the information attributes in the drivers of outcome measures and outcome measures found in SPMS (Kaplan & Norton, 1996). Information attributes of drivers of outcomes are: (a) subjective, (b) pre-implementation, and (c) lead

indicators of controls that articulate the strategy of the business but only for two perspectives of the balanced scorecard. Information attributes of outcomes are: (a) objective, (b) post-implementation, and (c) lag indicators of controls but only for two perspectives of the balanced scorecard (Kaplan & Norton, 1996).

Measuring Information Attributes

In determining Construct I, this research identifies with the information attributes found in the drivers of outcomes and outcomes in SPMS. To measure Construct I, Kaplan and Norton (1996) offer generic measures found in two of their four Balanced Scorecard perspectives: financial and customers.

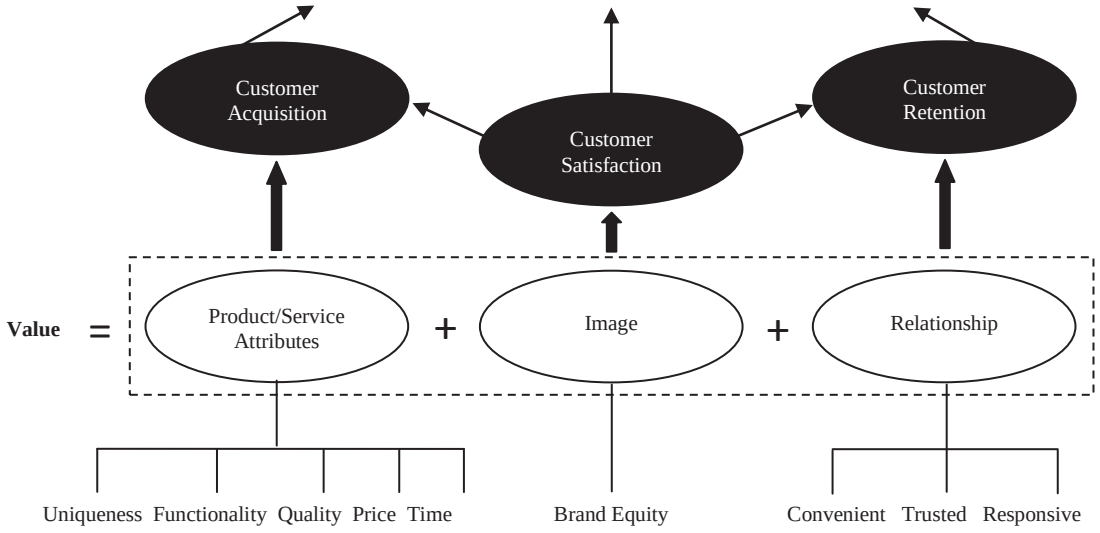
Financial: The measures found in three financial themes: revenue growth/mix, cost reduction/productivity improvement, and asset utilisation/investment strategy can be categorised into a business unit's growth (build), sustain (hold), and harvest missions (refer to Figure 3.3) (Kaplan & Norton, 1996). The financial themes correlate with the firm's strategy (refer to Figure 3.1). The information attributes of drivers of outcomes found in the financial theme of growth strategies (sales growth rates, percentage revenue from new product, services and customers, investment, and R&D percentage of sales) are consistent with a prospector/entrepreneur strategy (refer to Figure 3.1) and a strategic control board (refer to Figure 3.2). Similarly, the information attributes of outcomes found in the financial themes of sustain and harvest strategies are consistent with a defender/conservative strategy (refer to Figure 3.1) and a financial control board (refer to Figure 3.2).

Figure 3.3 Measures for Strategies and Financial Themes (Kaplan & Norton 1996, p. 58)

		Financial Themes		
		Revenue Growth and Mix Improvement	**Improvement**	**Asset Utilisation**
Business Unit Strategy	**Growth**	Sales growth rate by segment Percentage revenue from new product, services and customers		Investment (percentage of sales) R&D (percentage of sales)
	Sustain	Share of targeted customers and accounts Cross selling Percentage revenues from new applications Customer and product line profitability	Cost versus competitors Cost reduction rate Indirect expenses (percentage of sales)	Working capital ratios (cash-to-cash cycle) ROCE by key asset categories Asset utilisation rates
	Harvest	Customer and product line profitability Percentage unprofitable customers	Unit costs (per unit of output, per transaction)	Payback Throughput

Customer: Kaplan and Norton (1996) offer three categories of Customer Value Propositions (refer to Figure 3.4): products/service attributes (encompassing functionality, price and quality), image/reputation (proactively defining the firm for its customers), and customer relationship (includes delivery, response time and purchasing experience dimensions). The customer value propositions have lead indicator information attributes and are associated with drivers of outcomes. The generic customer measures: satisfaction, acquisition, and retention (refer to Figure 3.4) have lag indicator information attributes and are associated with the outcomes. It would be consistent for strategic control boards to identify with customer value information and financial control boards to identify with customer satisfaction, acquisition and, retention measures (refer to Figure 3.2).

Figure 3.4 Customer Measures (Kaplan & Norton 1996, p. 62)



3.2 DEPENDENT VARIABLE

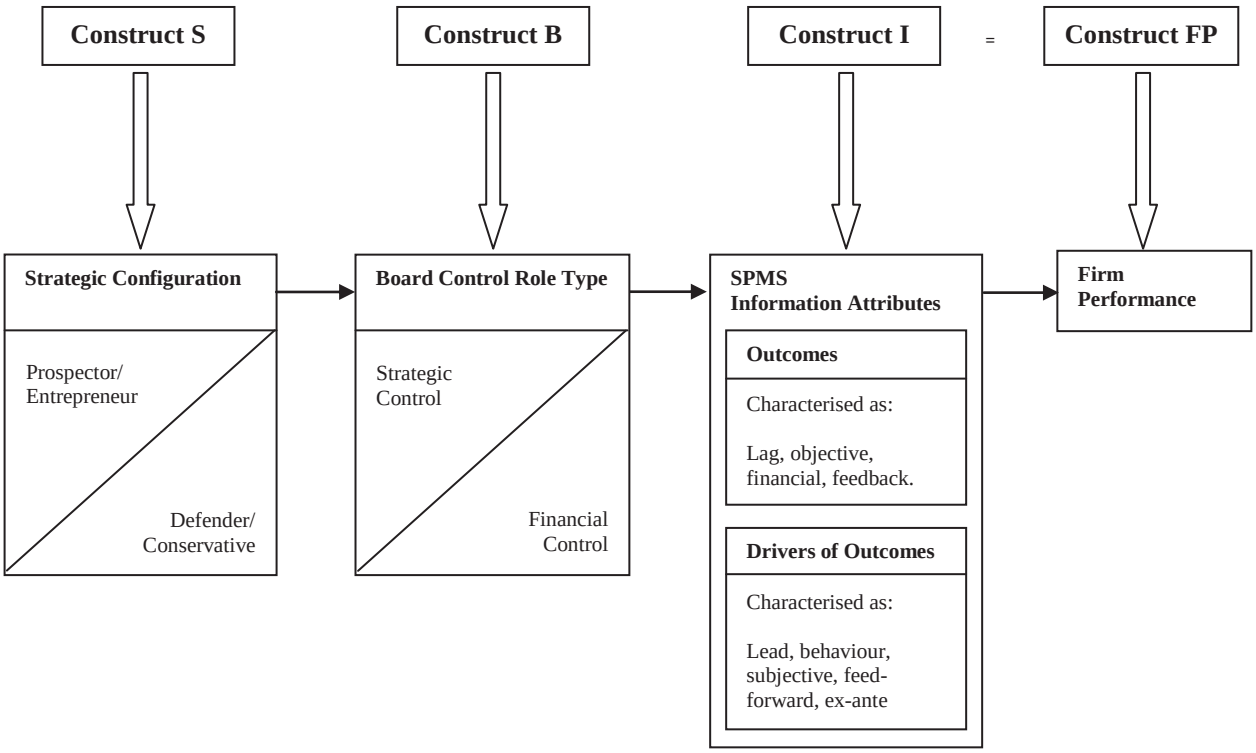
The board literature identifies with both accounting and market-based measures as a function of the nature of firm performance (Dalton & Dalton, 2005; Wagner III et al., 1998; Zahra & Pearce II, 1989). The literature argues that there are essential distinctions between the two measures. Accounting-based measures (return on equity - ROE, return on assets - ROA, profit margins, earnings per share - EPS, sales, and sales growth) are subject to managerial manipulation and are difficult to interpret across industry contexts, while market-based measures (share performance and shareholder returns) are sometimes beyond management's direct control. As such, Muth and Donaldson (1998) and Hamilton and Shergill (1992) generate a Composite Index of Firm Performance that subjects multiple firm performance measures to factor analysis based on weightings. Common in board studies, the Composite Index of Firm Performance's multiple measure (accounting and shareholder returns) approach is used because of the inherit limitations in any single performance measure (Rechner & Dalton, 1991). In addition, Cochran and Wood (1984) suggest performance measures fall into two broad categories, namely investor returns and accounting returns.

3.3 RESEARCH PROPOSITION, DIAGRAM AND HYPOTHESES

Contemporary performance measurement systems argue that performance measures that describe aspects of the implementation of the firm's strategy are more likely to be associated with better firm performance. The theory developed in Section 3.1 and 3.2 presents a framework for hypothesising an interaction among information attributes found in SPMS, the board's control role, and the firm's strategy that will be associated with enhanced firm performance. This proposition is represented in the below formula and research diagram (refer to Figure 3.5).

FP = *f* (Strategic Configuration [S]; Board Control Role Type [B]; Information Attributes [I])

Figure 3.5 The Research Diagram



Hypotheses 1

Research suggests that boards with better information practises produce better financial performance (Lawler et al., 2002). Research also suggests that SPMS drivers of outcomes (outcomes) have lead and subjective (lag and objective) information attributes (Kaplan & Norton, 1996) that are associated

with prospector (defender) strategies (Langfield-Smith, 1997). In addition, the lead and subjective (lag and objective) information attributes are also associated with the board's strategic control role (financial control role) (Hendry & Kiel, 2004).

As such, this study argues that there is a three-way interaction among Information Attributes, the firm's Strategic Configuration, and the Board's Control Role Type. This research hypothesises a three-way interaction among the three independent variables as follows:

P1: Proposes a three-way interaction among Strategic Configuration, Board Control Role Type, and Information Attributes, which when aligned will be associated with superior Firm Performance.

Stated in the Null:

$H1_0$: There is no association with the three-way interaction among Strategic Configuration, Board Control Role Type and Information Attributes, and Firm Performance.

Stated in the Alternative:

$H1_a$: The three-way interaction among Strategic Configuration, Board Control Role Type and, Information Attributes is associated with superior Firm Performance.

Statistically: $FP = \beta_0 + \beta_1 (S*B*I) + \beta_2 (S*B) + \beta_3 (S*I) + \beta_4 (B*I) + \beta_5 (S) + \beta_6 (B) + \beta_7 (I) + r$

Hypotheses 2(a) and 2(b)

Should the three-way interaction null hypothesis be supported, the sample will be split into prospector and defender strategy groups, and two-way interactions will be tested as follows:

Prospector Group:

Research suggests that SPMS drivers of outcomes (lead and subjective) and information attributes (Kaplan & Norton, 1996) are associated with the board's strategic control role (Hendry & Kiel, 2004) in prospector strategies. As such:

P2(a): Proposes that for prospector firms, the alignment of the strategic Board Control Role system and Information Attributes will be associated with superior Firm Performance.

Stated in the Null:

$H2(a)_0$: For prospector Strategic Configuration firms there is no association between the interaction of strategic Board Control Role system and Information Attributes and superior Firm Performance.

Stated in the Alternative:

$H2(a)_a$: Prospector Strategic Configuration firms whose boards choose a strategic Control Role system, incorporating driver information measures, are associated with superior Firm Performance.

Statistically: $FP = \alpha_0 + \alpha_1 (B*I) + \alpha_2 (B) + \alpha_3 (I) + r$

Defender Group:

Research suggests that SPMS outcomes (lag and objective) and information attributes (Kaplan & Norton, 1996) are associated with the board's financial control role (Hendry & Kiel, 2004) in defender strategies.

As such:

P2(b): Proposes that for defender firms the alignment of financial Board Control Role system and Information Attributes will be associated with superior Firm Performance.

Stated in the Null:

$H2(b)_0$: For defender Strategic Configuration firms there is no association between the interaction of financial Board Control Role system and Information Attributes and superior Firm Performance.

Stated in the Alternative:

$H2(b)_a$: Defender Strategic Configuration firms whose boards choose a financial Control Role system, incorporating output information measures, are associated with superior Firm Performance.

Statistically: $FP = \alpha_0 + \alpha_1 (B*I) + \alpha_2 (B) + \alpha_3 (I) + r$

Hypotheses 3

Should no significant two-way interactions be observed, then the main effects will be tested for association with superior Firm Performance.

P3(i): Proposes that Strategic Configuration is associated with superior Firm Performance.

Stated in the Null:

$H3(i)_0$: There is no association between Strategic Configuration and Firm Performance.

Stated in the Alternative:

$H3(i)_a$: Strategic Configuration is associated with superior Firm Performance.

Statistically: $FP = \gamma_0 + \gamma_1 (S) + r$

P3(ii): Proposes that Board Control Role type is associated with superior Firm Performance.

Stated in the Null:

$H3(ii)_0$: There is no association between Board Control Role type and Firm Performance.

Stated in the Alternative:

$H3(ii)_a$: Board Control Role type is associated with superior Firm Performance.

Statistically: $FP = \gamma_0 + \gamma_1 (B) + r$

P3(iii): Proposes that Information Attributes are associated with superior Firm Performance.

Stated in the Null:

$H3(iii)_0$: There is no association between Information Attributes and Firm Performance.

Stated in the Alternative:

$H3(iii)_a$: Information Attributes is associated with superior Firm Performance.

Statistically: $FP = \gamma_0 + \gamma_1 (I) + r$

3.4 CHAPTER SUMMARY

This chapter develops the theory that determines both the independent variables: Constructs S, B, and I; and the dependent variable: the Composite Index of Firm Performance. Construct S is the firm's Strategic Configuration and identifies with the Langfield-Smith (1997) prospector/entrepreneur and defender/conservative strategic dichotomy. Construct B is the Board's Control Role and identifies with the Hendry and Kiel (2004) strategic control and financial control typology. Construct I is the Information Attributes and identifies with drivers of outcomes and outcomes as offered by SPMS and are measured by the generic financial and customer measures in the Balanced Scorecard offered by Kaplan and Norton (1996).

The dependent variable is the Composite Index of Firm Performance as offered by Muth and Donaldson (1998) and Hamilton and Shergill (1992). To generate the Composite Index of Firm Performance, multiple performance measures are subjected to factor analysis.

The methodology to test the theory and hypotheses developed in this chapter is presented in Chapter 4.

CHAPTER 4

METHODOLOGY

4.0 INTRODUCTION

The discussion in Chapter 2 and the theoretical development and hypothesis in Chapter 3 propose a three-way interaction between the firm's Strategic Configuration, the Information Attributes associated with implementing the firm's strategy, and the Board's Control Role type. In Chapter 3 it was hypothesised that the proposed three-way interaction among these variables will be associated with enhanced Firm Performance. Firm Performance is the dependent variable and is the criterion against which the hypothesised three-way interaction will be tested. This chapter describes the research methodology used to obtain the data to test this proposition. In testing the proposition, this research relies on the requirement for companies registered on the Australian Stock Exchange (ASX) to have a board of directors and in addition, either implicitly or explicitly stated, that they will have strategies. As such, the data collected are from the publicly listed companies registered on the ASX.

The chapter is structured in the following manner: Section 4.1 presents an overview of the data collection, survey methods, and the board chairperson. Section 4.2 describes and summarises the survey, details the pilot testing, and presents the cover letters; Section 4.3 explains the archival sources of data; Section 4.4 details the statistical methodology; and Section 4.5 discusses the survey outcomes and response bias. Section 4.6 summarises the chapter.

4.1 OVERVIEW

4.1.1 Data Collection

Two methods of collecting data were used: archival and a survey. Archival data was sourced from data bases of public company disclosures and reports, which provided firm performance and corporate governance data, but represents less than 20% of the variables required. A survey was used for the remainder of the variables. It asked about the extent to which boards draw on certain types of

information in implementing their strategies, the extent to which boards identify with the strategic roles described in the literature, and the firm's Strategic Configuration. The combination of both archival and survey methods has often been deployed in this type of research. For example, a study investigating the relationship between board characteristics and board information adopted the survey and archival database method of data collection (Rutherford & Buchholtz, 2007). Use of surveys is also established; for example, a study examining the relationship between strategy and subjective and objective information attributes, where the performance measures were department specific, uses a survey method of data collection (van der Stede, Chow, & Lin, 2006).

4.1.2 Survey Methods

While it is necessary to acknowledge that survey methods expose studies to internal validity threats, this research is concerned with eliciting facts and beliefs from the board's experiences in the context examined. Survey methods offer this strength when, as is the case in this research, external validity is at a premium. This research selected a written survey questionnaire via a mail or web option. The survey was sent to a specifically identified individual, thus avoiding anonymity, to elicit a candid and a more carefully considered response. In addition, and consistent with the decreasing response rate norm on all types of surveys (Brooks, Oliver, & Veljanovski, 2009; Toourangeau & Source, 2004), a low response rate of 7.2% experienced in this research is acknowledged.

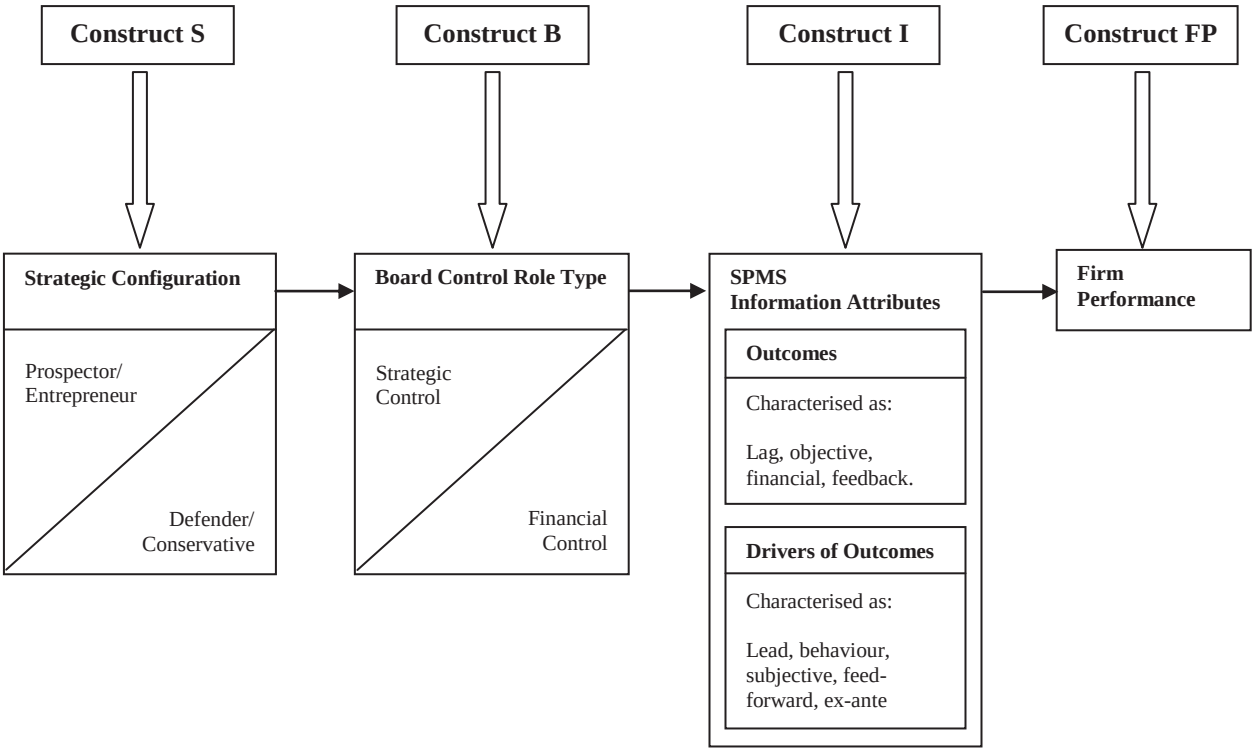
4.1.3 Chairperson

The methodology requires that each company complete one survey, thereby eliminating contradicting or conflicting data in the collection process. The board "chairs" of Australian companies are reported (Kakabadse & Kakabadse, 2007) as being held accountable for both the board and firm performance and are "stewards" of the vision of the company. In addition, Australian chairpersons, jointly with CEOs, determine the nature of the role delineation of the board (Kakabadse & Kakabadse, 2007). As such, each survey was addressed to the chairperson of the Australian company registered on the ASX. Where the ASX Company did not identify a chair of the board (which equated to 6.7% of the total sample of companies surveyed), the director with the longest tenure was selected.

4.2 THE SURVEY

The survey was structured into six sections: A to F (refer to Appendix 4A). Each section has specific questions that are used to develop and measure the variables in testing the research hypotheses detailed in Chapter 3. Each question elicited responses on a seven-point Likert scale to allow the board chairperson flexibility in a more carefully considered response. In addition, each section's questions are specifically related to and address the variables described in Chapter 3, resulting in four sets of questions directed at measuring the four required variables. To manage this relationship, the four constructs in the research diagram in Chapter 3 were named (refer to Figure 4.1). Three constructs represent the independent variables and the fourth represents the dependent variable. Construct S relates to questions that are specific to the firm's Strategic Configuration. Construct B is the Board's Control Role type and Construct I is Information Attributes. The Firm Performance Construct (FP) draws its inputs from archival data. Each of the survey sections (A to F) relative to the constructs are discussed after Figure 4.1.

Figure 4.1 The Four Constructs



Survey Questions Section A: Construct I

Construct I		
Question Number	**Survey Question**	**Source**
Section A	Please indicate to what extent your Board draws on the following **financial** information:	
Q1	Sales growth	Kaplan, R. S. and D. P. Norton (1996)
Q2	Sales in new markets and to new customers and/or Sales from new products and services	Kaplan, R. S. and D. P. Norton (1996)
Q3	Investment and spending levels in for e.g. product and process development (R&D), systems and employee capabilities	Kaplan, R. S. and D. P. Norton (1996)
Q4	Investment in the establishment of new marketing, sales and distribution channels	Kaplan, R. S. and D. P. Norton (1996)
Q5	Traditional Measures such as Return on Capital Employed, operating income, gross margins etc	Kaplan, R. S. and D. P. Norton (1996)
Q6	Traditional measures for investment projects e.g. Discounted Cash flow and Capital Budgeting Analysis	Kaplan, R. S. and D. P. Norton (1996)
Q7	Cash Flow	Kaplan, R. S. and D. P. Norton (1996)
Q8	Asset utilisation for e.g. working capital ratios, paybacks and throughput	Kaplan, R. S. and D. P. Norton (1996)

Modern strategic performance measurement systems (SPMS) have information attributes that offer a balance between desired outcomes (hard objective measures) and drivers of those outcomes (softer more subjective measures) (Kaplan & Norton, 1996). These measurements also have information attributes that are characterised as either "before the event" (known as ‘lead’ measures), which are of a strategic and behavioural control nature; or "after the event" (known as ‘lag’ measures), which have a financial and outcome control nature. Kaplan and Norton’s (1996) experience in observing and building scorecards offers generic “outcome” and “driver of outcome” measures in both the financial and customer perspectives of the Balanced Scorecard.

Kaplan and Norton (1996) categorise financial performance measures into three financial themes that differ depending on the strategy situation of the firm: growth, sustain, or harvest strategies. This research re-categorises the generic financial measures into two relevant prospector/entrepreneur (growth) and defender/conservative (sustain/harvest) strategies consistent with Langfield-Smith (1997).

Section A of the survey includes questions addressing both the generic financial outcomes and drivers of outcome measures in Construct I.

Familiar financial performance measures, such as return on capital employed; operating income and gross margins, together with investment discounted cash flow and capital budgeting measurements; cash flow and asset utilisation are the generic financial outcomes measures and are consistent with the defender/conservative strategy (Kaplan & Norton, 1996).

Sales growth, sales in new markets, and sales from new products and services, together with investment and spending levels in research and development, and the establishment of new markets and distribution channels are the generic drivers of outcomes measures and are consistent with the prospect/entrepreneur strategy (Kaplan & Norton, 1996).

The theory developed in Chapter 3 proposes that strategic information attributes, which are characterised as drivers of outcomes, are likely to best support a prospector Strategic Configuration and strategic Control Type boards. Similarly, financial information attributes are characterised as outcomes and will support defender strategies and financial control type boards.

The objective of the survey, arising out of the theoretical proposal of this research, was to capture the data that will in turn be used to examine the relationship of strategic information attributes and financial information attributes to the firm's Strategic Configuration and the Board's Control Role type.

The first four questions (1-4) in Section A of the survey explore the firm's reliance on strategic information attributes. As the drivers of the financial outcomes, they are the lead measures. The second four questions (5 - 8) in Section A are about financial information attributes and are lag outcome measures. All questions in Section A probe the extent to which the board draws on financial information.

Survey Questions Section B: Construct I

Construct I		
Question Number	**Survey Question**	**Source**
Section B	Please indicate to what extent your Board draws on the following **customer/client** information:	
Q9	Customer/client satisfaction measures	Kaplan, R. S. and D. P. Norton (1996)
Q10	Image and reputation dimensions which enables the company to pro-actively define itself for its customers e.g. brand equity	Kaplan, R. S. and D. P. Norton (1996)
Q11	Customer/client acquisition measures	Kaplan, R. S. and D. P. Norton (1996)
Q12	Product/service attributes (encompass the functionality of the product /service, its price, its uniqueness, and its quality)	Kaplan, R. S. and D. P. Norton (1996)
Q13	Customer/client retention measures	Kaplan, R. S. and D. P. Norton (1996)
Q14	Customer/client relationship dimension (includes product/service delivery e.g. convenience, trust and response)	Kaplan, R. S. and D. P. Norton (1996)
Section F		
Q41	To what extent can the information your Board receives be described as "outcomes" which is characterised as objective, financial, feedback and after the event type information	Not applicable
Q42	To what extent can the information your Board receives be described as "drivers of outcomes" which is characterised as subjective, behavioural, feed-forward and before the event type information	Not applicable

Kaplan and Norton (1996) offer generic measures of customer outcomes and drivers of outcomes. Described as value propositions, the drivers, together with the outcome, are organised into three categories:

- Product/Service Attributes encompass the functionality of the product/service, its price, its uniqueness, and quality. The attributes drive customer acquisition outcomes.

- Image and Reputation dimensions enable the company to define itself for its customers in the form of brand equity and drives customer satisfaction outcomes.

- Relationship dimensions include delivery, convenience, trust, and response and drive customer retention outcomes.

Six questions (9 -14) in Section B of the survey, three lag and three lead measures, ask about the extent to which the board draws on customer/client information. The customer value proposition drivers have strategic information attributes, while the customer outcome measures are consistent with

financial information attributes being objective and lag measures.

Kaplan and Norton (1996) describe the learning and growth and internal business process of the Balanced Scorecard using case studies. Further research, using case study methodology, could determine the board's use of driver of outcomes and outcome information attributes from the learning and growth and internal business process perspectives. However, given there are no generic measures for the learning and growth and internal business process perspectives, they are not included in the survey or as part of this research.

In addition to using the generic financial and customer perspectives in strategic performance measurement systems, a more direct approach was used to elicit information about boards' reliance on strategic and/or financial information attributes. Questions 41 and 42 of Section F describe outcomes and drivers of outcome measures respectively, and then ask to what extent boards agree that their own information could be characterised as either outcomes or drivers of outcomes.

Survey Questions Section C and E: Construct B

Construct B		
Question Number	**Survey Question**	**Source**
Section C	How intense is each of the following in your industry?	
Q15	Bidding for purchases or raw materials	Gordon, L. A. and V. K. Narayanan (1984)
Q16	Competition for manpower	Gordon, L. A. and V. K. Narayanan (1984)
Q17	Price competition	Gordon, L. A. and V. K. Narayanan (1984)
Q18	How many new products and/or services have been marketed during the past 5 years by your industry?	Gordon, L. A. and V. K. Narayanan (1984)
	How stable/dynamic is the external environment (economic and technological) facing your firm?	
Q19	Economic	Gordon, L. A. and V. K. Narayanan (1984)
Q20	Technological	Gordon, L. A. and V. K. Narayanan (1984)
Q21	How would you classify the market activities of your *competitors* during the past 5 years?	Gordon, L. A. and V. K. Narayanan (1984)
Q22	During the past 5 years, the tastes and preferences of your *customers* have become	Gordon, L. A. and V. K. Narayanan (1984)
Q23	During the past 5 years, the legal, political and economic constraints surrounding your firm have	Gordon, L. A. and V. K. Narayanan (1984)
Q24	How often do new technological advances emerge in your industry?	Gordon, L. A. and V. K. Narayanan (1984)
Section E		
Q31	In general, the information available to the board is very reliable	Rutherford, M. A. and A. K. Buchholtz (2007)
Q32	In general, the available information is relevant to the board's needs	Rutherford, M. A. and A. K. Buchholtz (2007)
Q33	In general, the board receives information in a timely fashion	Rutherford, M. A. and A. K. Buchholtz (2007)
Q34	At a typical board meeting, the board actively probes for information necessary to carry out their duties	Rutherford, M. A. and A. K. Buchholtz (2007)

Hendry and Kiel (2004) developed a theoretical perspective to explain the role of the board in strategy. Integrating organisational control and agency theory, they argue that boards exercise a system of financial and strategic control. In their typology, Hendry and Kiel (2004) argue that boards that exercise a system of both financial and strategic control are classed as "board as management". Those that exercise neither are classed as "rubber stamp" boards. Boards exercise their control in a parallel or similar manner to those used by corporate managers and top management teams (TMT). The degree to which boards exercise financial or strategic control is dependent upon three contingent

factors: environmental uncertainty, board power, and information asymmetry. Taking an indirect approach, this research makes use of these contingent factors to establish the Board's Control Role in strategy.

- Environmental uncertainty: Gordan and Narayanan (1984), in finding that decision-makers seek management accounting information (i.e. non-financial and lead indicators) under greater perceived environmental uncertainty, offer a series of questions designed to predict industrial, economic, technological, competitive, and customer environmental uncertainty. Ten questions (15 to 24) in Section C of the survey, adapted from the Gordon and Narayanan (1984) design, determine the extent of the board's perceived environmental uncertainty. Hendry and Kiel (2004) propose perceived environmental uncertainty will be positively (negatively) related to strategic control (financial control).

- Board power: Archival data was used to determine CEO duality, CEO tenure relative to board member's average tenure, chairperson's seniority, and percentage of ordinary shares owned by outside directors. These are measures used by Zajac and Westphal (1996) to establish board power. Hendry and Kiel (2004) propose board power will be positively (negatively) related to strategic control (financial control).

- Information asymmetry: Board composition, outside tenure, quality of information, proactive information seeking, and frequency of board interaction are regarded as particularly important when boards consider reducing information asymmetry (Rutherford & Buchholtz, 2007). Two of the five measures—quality of information and proactive information seeking—were included in the survey as Questions 31 to 34 of Section E. The remaining three measures were collected using Archival data. Hendry and Kiel (2004) propose information asymmetry will be positively (negatively) related to financial control (strategic control).

Survey Questions Section D: Construct B

Construct B		
Question Number	**Survey Question**	**Source**
Section D	Please indicate to what extent you agree with the following statements:	
Q25	The board shapes the **context** of strategy by setting the conditions under which the strategy process happens in the organisation	Hendry, K. and G. C. Kiel (2004)
Q26	The board shapes the **content** of strategy by requiring that management justify their intentions, by evaluating alternatives and by continuously monitoring progress during formulation and assessment stage	Hendry, K. and G. C. Kiel (2004)
Q27	The board shapes the **conduct** of strategy by continuously monitoring implementation and results and by making changes where appropriate	Hendry, K. and G. C. Kiel (2004)
Q28	The board sets financial targets only and takes strategic decisions relative to these financial targets by approving, rejecting or referring strategic proposals back to management	Hendry, K. and G. C. Kiel (2004)
Q29	The board exerts influence over management at formal board meetings after resources have been committed and spending approved	Hendry, K. and G. C. Kiel (2004)
Q30	The board evaluates management on the financial results of the firm	Hendry, K. and G. C. Kiel (2004)

Hendry and Kiel (2004) define strategic control boards as those shaping the context, content, and conduct of strategy; and financial control boards as those setting financial targets, exerting influence after resource allocation, and evaluating performance using financial results. To determine the degree that boards exercise financial or strategic control, the survey uses questions that Hendry and Kiel (2004) used to define boards as strategic or financial control boards.

Three questions (25 to 27) of Section D in the survey relate to strategic control boards as shaping the context, content, and conduct of strategy. Also defined as behaviour control and involving subjective assessment of strategic decisions pre-implementation, these are consistent with strategic information attributes.

The final three questions (28 to 30) of Section D relate to financial control boards as setting financial targets, exerting influence after resource allocation, and evaluating on financial results. Also defined as outcome control involving financial performance post implementation, they are consistent with financial information attributes.

Survey Questions Section F: Construct S

Construct S		
Question Number	**Survey Question**	**Source**
Section F	Please indicate to what extent you agree with the following statements:	
Q35	Our firm's strategy does not aggressively pursue markets but finds and maintains a relatively stable and secure market	Langfield-Smith, K. (1997)
Q36	Our firm's strategy is to expand into new markets, stimulate new opportunities and obtain additional market share	Langfield-Smith, K. (1997)
Q37	Operations (e.g. production and engineering efficiency)	Langfield-Smith, K. (1997)
Q38	Finance	Langfield-Smith, K. (1997)
Q39	Marketing	Langfield-Smith, K. (1997)
Q40	Research and development	Langfield-Smith, K. (1997)

Langfield-Smith (1997), in suggesting that MCSs should be explicitly tailored to support the strategy of the firm, configured the prospector/entrepreneur and defender/conservative strategic combination. Prospectors expand into new markets and stimulate new opportunities to obtain additional market share. The functions critical for prospector strategies are marketing and research and development. Defenders maintain relatively stable and secure markets and do not aggressively pursue new opportunities. The functions critical for defender strategies are finance and operations. Six questions (35 to 40) of Section F in the survey require an indication as to what extent the board identified the firm's strategy as being more a prospector or defender type. The reliance on behaviour controls implies subjective performance evaluation; it is associated with prospector strategies and is consistent with strategic information attributes and the boards' strategic role. The reliance on outcome controls implies objective performance evaluation and supports defender strategies and, therefore, is consistent with financial information attributes and the board's financial role.

4.2.1 Survey Summary

Both Sections A and B of the survey have eight questions each that draw on financial and customer/client information from strategic performance measurement systems. Each question establishes the financial and/or strategic Information Attributes (Construct I). Section C has ten questions specific to environmental uncertainty and will be used, along with other contingencies, to

indirectly determine a Board's Control Role type (Construct B). Section D has six questions that directly attempt to determine a Board's Control Role type (Construct B). Section E's four questions are the second contingency, information asymmetry, used indirectly to determine a Board's Control Role type (Construct B). The final section, Section F, has six questions to establish the firm's Strategic Configuration as either prospector/entrepreneur and/or defender/conservative combinations.

4.2.2 Survey Pre-Test

The survey was pre-tested by administering it to three practising board directors. Based on their observations and comments it was redesigned, edited, and corrected. Three academic professors, knowledgeable in survey methodology, offered their time to comment and review the survey.

Three practising board directors were asked to complete the survey and comment on any parts that they found unclear or difficult to answer. In addition, they were asked to critically comment on how they found the whole experience and process. They were also asked, with the intention of it taking no more than ten minutes, how long it took to complete the survey. The directors were also asked for advice on the covering letter from Bond University and the university's ethical compliance.

The comments and suggestions from the three practising directors and academic professors are detailed in Appendix 4B and edited so as to protect anonymity.

Once all comments and suggestions had been considered, the survey was finalised and prepared for mailing and web. QuestionPro Survey Analytical Engine was used to source the web option data. Email addresses were correlated to the main data list and only 84 company addresses where not available.

4.2.3 Covering letter

The next step was the design of the covering letter (refer to Appendix 4C) and the supporting web option cover (refer to Appendix 4D), which summarised the objective of the survey. A short paragraph described the survey and its significance, both to the academic and practitioner

stakeholders. In addition, it acknowledged that responses were to be combined with publicly available information and, in recognising the sensitive nature of the responses, it assured confidentiality. The covering letter included Bond University's ethics protocol and quoted its project number R0427. Morris International coordinated the mail merge and sent out the surveys.

4.3 ARCHIVAL DATA

Archival databases were used to collect the Australian Stock Exchange (ASX) companies, addresses, and the board chair data, plus corporate performance and corporate governance data on survey respondents.

Australian Stock Exchange Data

Two databases: Bloomberg Reuters (1772 records) and DatAnalysis (Morning Star) (1545 records) were coordinated to populate the final survey list of 1911 records. Each record contained the ASX code, registered company address, chair name, salutation, and/or title in the survey list.

Corporate Details

The archival database DatAnalysis (Morning Star) was used to source Board Power, the final contingency and independent variable data in determining the board's strategic role. Four measures: CEO duality; CEO tenure relative to board member's average tenure; chairperson's seniority; and lastly, the percentage of ordinary shares owned by outside directors are the measures Zajac and Westphal (1996) used to establish board power. Hendry and Kiel (2004) propose board power will be positively (negatively) related to strategic control (financial control).

Cochran and Wood (1984) argue that corporate performance measures fall into two broad categories: shareholder returns and accounting returns. In support, prior board research with corporate performance as a dependent variable used a composite index of corporate performance and performance factors as the measure (Hamilton & Shergill, 1992; Muth & Donaldson, 1998). The measures used for the composite index of corporate performance are sourced from the FinAnalysis

Database and comprise earnings before interest and tax (EBIT), return on equity (R0E), return on assets (R0A), and sales growth for the periods 2008 and 2009. Two separate measures of shareholder returns were calculated – one where shares were held for one year, and the second where shares were held for three years.

4.4 STATISTICAL METHODOLOGY

The statistical process is summarised into the following steps:

1. Descriptive Statistics

The process of data screening (assessing normality), transformation, descriptive statistics (measures of central tendency), and correlations were undertaken. Summaries of mean, median, mode, standard deviation, range, number of valid responses, skewness, and kurtosis will be presented.

2. Developing the Factors and Reliability Analysis

Factor analysis, common in board studies (Dey, 2008; Hamilton & Shergill, 1992; Muth & Donaldson, 1998) is used to reduce the large number of variables into a smaller set of underlying factors that describe the independent and dependent variables. For the reliability analysis, Cronbach's alpha is used to measure internal consistency, which has a relationship with factor analysis (Zinbarg, Revelle, Yovel, & Li, 2005).

3. Hypothesis Testing

Multiple regression analysis is used to test the hypotheses presented in Chapter 3.

4.5 SURVEY OUTCOMES AND SUMMARY

The circulation of surveys and collection replies was processed over a period of eight months, which included one reminder for both the mail and web surveys (refer to Table 4.1A). The first mail surveys

were sent out in February/March of 2010, and the last reply finalised at the end of September 2010. Over 89 courteous replies declining to participate were received stating company policy, non-relevance, and non-availability. One hundred thirty-seven complete, usable survey replies were received. While expecting a response rate of approximately 9% (Graham & Harvey, 2001), a low response rate of 7.2% is acknowledged (refer to Table 4.1B), but is consistent with the decreasing response rate norm as evidenced by Brooks et al. (2009) and Toourangeau and Source (2004). However, 137 replies is a higher outcome than Kakabadse and Kakabadse's (2007) survey, which resulted in just over 100 responses. Stiles (2001) regards 51 interviews at board, CEO, and top management team (TMTs) as sufficient.

Table 4.1A Survey Replies

Mode of Survey	No. Sent	Replies
Mail 1	1911	58
Mail 2	1787	35
Web 1	1833	20
Web 2	1726	24
Total		**137**

Table 4.1B Data Summary

Description	No.	%
Total requests	1911	100
- Replies can't complete	89	
- non responses	1685	
Responses	137	7.2
- missing data (independent variables)	22	
Listwise N (refer to Table 5.10)	115	6
- missing data (dependent variables)	55	
Total	60	3.1

Twenty of the 24 GICS industry group sectors are represented in the survey replies. A Chi-square goodness-of-fit test (refer to Table 4.2 calculated in Microsoft excel) reveals there is no significant difference, $\chi 2$ (23, N=137) = 0.3061, p = 1, between the percentage of ASX companies and the survey replies represented in the GICS industry sectors. However, a low response rate would suggest the research results might not be representative of the entire population of ASX listed companies.

Table 4.2 Chi-square goodness-of-fit Test

GICS Industry Group	Survey	Observed Percentage	ASX	Expected Percentage	$\chi 2$
Automobiles & Components		0%	10	0%	0.0049
Banks	1	1%	12	1%	0.0004
Capital Goods	7	5%	112	5%	0.0002
Commercial & Professional Services	10	7%	57	3%	0.0734
Consumer Durables & Apparel	3	2%	32	2%	0.0025
Consumer Services	1	1%	42	2%	0.0085
Diversified Financials	6	4%	201	10%	0.0300
Energy	9	7%	232	11%	0.0199
Food & Staples Retailing		0%	5	0%	0.0024
Food, Beverage & Tobacco	6	4%	39	2%	0.0323
Health Care Equipment & Services	7	5%	66	3%	0.0111
Household & Personal Products		0%	1	0%	0.0005
Insurance	3	2%	11	1%	0.0509
Materials	47	34%	747	36%	0.0012
Media	4	3%	46	2%	0.0020
Pharmaceuticals, Biotechnology & Life Sciences	5	4%	87	4%	0.0008
Real Estate	6	4%	112	5%	0.0022
Retailing	2	1%	37	2%	0.0007
Semiconductors & Semiconductor Equipment		0%	3	0%	0.0015
Software & Services	10	7%	76	4%	0.0348
Technology Hardware & Equipment	4	3%	33	2%	0.0107
Telecommunication Services	1	1%	26	1%	0.0023
Transportation	1	1%	29	1%	0.0033
Utilities	4	3%	34	2%	0.0096
Totals	**137**	**100%**	**2050**	**100%**	**0.3061**
Significance level a = 0.05					
p value = 1					

Response Bias

Response bias is the threat that respondents to the survey are not representative of the population

(Armstrong & Overton, 1977). The assumption of the 'continuum of resistance model' (Lahaut, Jansen, van de Mheen, Garretsen, Verdurmen, & van Dijk, 2003; Lin & Schaeffer, 1995) is to use late respondents as a proxy for non-respondents. Non-response bias is estimated by comparing early and late respondents.

Two types of response bias were tested: early versus late response bias and mail versus web response bias. Tests for response bias are based on organisational size (market capitalisation), board characteristics represented by number of committees (committees) and board composition (comp), and a board power variable (Zajac & Westphal, 1996) co-optation (co-opt). Co-optation is the proportion of independent directors appointed before the CEO.

A Chi-square goodness-of-fit test is used to determine if there is any significant difference between early versus late and mail versus web responses. The surveys are summarised into early and late mail (mail 1 and mail 2) responses and early and late web (web 1 and web 2) responses (refer to Appendix 4E). The results of the summary are reconciled into mail and web totals (refer to Table 4.3A). The Chi-square goodness-of-fit test results (refer to Table 4.3B) reveal there is no significant difference between early and late and mail and web responses:

Mail versus Web:

Co-optation $\chi 2\ (2, N=35) = 0.0304, p = 0.985$

Composition $\chi 2\ (2, N=35) = 0.0088, p = 0.995$

Committees $\chi 2\ (3, N=35) = 0.2788, p = 0.960$

Market Capital $\chi 2\ (2, N=35) = 0.1241, p = 0.940$

Early versus Late:

Co-optation $\chi 2\ (2, N=24) = 0.0719, p = 0.965$

Composition $\chi 2\ (2, N=24) = 0.1143, p = 0.944$

Committees $\chi 2$ (3, N=24) = 0.0986, p = 0.991

Market Capital $\chi 2$ (2, N=24) = 0.0205, p = 0.989

Given the above results, there is no evidence to suggest that response bias would adversely affect the research.

Table 4.3A Reconciled Survey Responses

						Mail vs Web			Early vs Late		
Variable	**Mail 1**	**Mail 2**	**Web 1**	**Web 2**		**Mail**	**Web**		**1**	**2**	
Co-opt											
High	17	12	3	10		29	13		20	22	
Low	15	12	8	2		27	10		23	14	
None	26	11	9	12		37	21		35	23	
Total	**58**	**35**	**20**	**24**	**137**	**93**	**44**	**137**	**78**	**59**	**137**
Comp											
High	27	22	10	13		49	23		37	35	
Medium	18	10	4	8		28	12		22	18	
Low	13	3	6	3		16	9		19	6	
Total	**58**	**35**	**20**	**24**	**137**	**93**	**44**	**137**	**78**	**59**	**137**
Committees											
3	25	15	8	7		40	15		33	22	
2	18	13	4	5		31	9		22	18	
1	8	6	3	8		14	11		11	14	
0	7	1	5	4		8	9		12	5	
Total	**58**	**35**	**20**	**24**	**137**	**93**	**44**	**137**	**78**	**59**	**137**
Market Cap											
Large	9	6	1	1		15	2		10	7	
Medium	14	12	5	6		26	11		19	18	
Small	35	17	14	17		52	31		49	34	
Total	**58**	**35**	**20**	**24**	**137**	**93**	**44**	**137**	**78**	**59**	**137**

Table 4.3B Chi-square goodness-of-fit Test

Test Variable	Mail vs Web %				Early vs Late %			
	Observed	Expected	$\chi 2$	P value	Observed	Expected	$\chi 2$	P value
Co-opt								
High	30%	31%	0.0009	**0.984911**	37%	26%	0.0529	**0.964699**
Low	23%	29%	0.0137		24%	29%	0.0112	
None	48%	40%	0.0159		39%	45%	0.0077	
Total	100%	100%	0.0304		100%	100%	0.0719	
Comp								
High	52%	53%	0.0000	**0.995589**	59%	47%	0.0298	**0.944443**
Medium	27%	30%	0.0027		31%	28%	0.0019	
Low	20%	17%	0.0061		10%	24%	0.0827	
Total	100%	100%	0.0088		100%	100%	0.1143	
Committees								
3	34%	43%	0.0185	**0.960539**	37%	42%	0.0060	**0.991282**
2	20%	33%	0.0498		31%	28%	0.0019	
1	25%	15%	0.0657		24%	14%	0.0657	
0	20%	9%	0.1633		8%	15%	0.0310	
Total	100%	100%	0.2788		100%	100%	0.0986	
Market Cap								
Large	5%	16%	0.0832	**0.939821**	12%	13%	0.0007	**0.989787**
Medium	25%	28%	0.0031		31%	24%	0.0155	
Small	70%	56%	0.0378		58%	63%	0.0043	
Total	100%	100%	0.1241		100%	100%	0.0205	
Significance level a = 0.05								

4.6 CHAPTER SUMMARY

This chapter has discussed the methodology applied to obtain the data that will test the hypotheses presented in Chapter 3. The survey methodology was designed to elicit specific facts from the board's experiences in this research context with external validity at a premium. Survey methods offer this particular strength, but at the cost of some loss of internal validity. The survey was sent to the board chair, thus avoiding anonymity and eliciting a candid and a more carefully considered response. The statistical analysis and results are discussed in Chapters 5 and 6.

CHAPTER 5

DETERMINING THE VARIABLES

5.0 INTRODUCTION

This chapter describes and presents the determination of the construct variables I, B and S by establishing patterns of correlation in the observed data as per the methodology presented in Chapter 4 (refer to Figure 4.1). This chapter presents the reduction of data using exploratory factor analysis and reliability analysis to determine the construct variables. The variables will be used in Chapter 6 to test the hypotheses developed in Chapter 3. It was argued that an interaction, if observed, among the firm's Strategic Configuration, the Information Attributes found in SPMS and the Board's Control Role type is associated with Firm Performance.

To obtain the data to test the three hypotheses developed in Chapter 3 the research design includes a survey and archival data. A total of 59 data variables, 42 in the survey and 17 sourced from archival data, are used in the analysis. Forty-seven (42 survey and 5 archival data) of the 59 are independent variables and 12 (all archival data) are dependent variables. Factor analysis is used to reduce the large number of variables to a smaller set of underlying factors that describe the independent and dependent variables. Using factor analysis for this purpose is common in board studies (Dey, 2008; Hamilton & Shergill, 1992; Inglis & Alexander, 1999; Muth & Donaldson, 1998; Zajac & Westphal, 1995).

Chapter 5 proceeds as follows: Section 5.1 presents the preparation of the data files from the survey and archival data and includes defining/naming the variables and reverse-coding the relevant variables for analysis. Section 5.2 describes the statistical characteristics of the data variables. Section 5.3 develops the factors and determines the reliability analysis using Cronbach's alpha. Section 5.4 summarises the chapter.

5.1 PREPARATION OF THE DATA FILES

5.1.1 Naming the Variables

The 59 variables used in the analysis were placed into a data file. They are 42 survey replies and 17 archival data variables together with their ASX code (refer to Excel Appendix 5A). The ASX codes are coded as a nominal measurement level and string data type and the 59 variables as a scale measurement level and a numeric data type. The naming of the 59 variables in the Statistical Package for the Social Sciences (SPSS) (Version 18 Release 18.0.0 dated 30 July 2009) database is presented in three tables.

Table 5.2 presents 28 of the 42 survey questions that describe the three constructs (refer to Chapter 4 and Figure 4.1): Information Attributes (I), firm Strategy Configuration (S) and the Board's Control Role type (B) and presents the data for naming the independent variables I, B and S.

Table 5.3 presents 14 survey questions (the balance of the 42 survey questions) and 5 of the 17 archival data variables that describe the Board Control Role contingencies (Information Asymmetry, Environmental Uncertainty and Board Power) as proposed by Hendry and Kiel (2004).

Table 5.4 presents the naming of the 12 dependent variables and are the balance of the 17 archival data variables, describing the Composite Index of Firm Performance.

5.1.2 Reverse-Coding

The survey questions that ultimately describe the three constructs (refer to Chapter 4 and Figure 4.1) S, B and I are scored on a Likert scale where 1 indicates a low response and 7 indicates a high response. However each construct is represented by two opposing alternatives: for example prospector or defender alternatives represent Construct S. In the survey, each alternative is represented by high scores in different questions. As such, the data needs to be oriented in the same direction, and this is achieved through transforming the data by reverse-coding using the scale in Table 5.1. The reverse-coding for each construct is detailed below.

Table 5.1 Reverse-coding Scale

Old Value	New Value
1	7
2	6
3	5
4	4
5	3
6	2
7	1

Construct S has prospector or defender alternatives that describe the firm's Strategic Configuration. Survey questions 36, 39, and 40 describe prospector strategies where 7 is a high score and agrees and 1 is a low score and disagrees. Survey questions 35, 37, and 38 describe defender strategies where 7 is a high score and agrees and 1 is a low score and disagrees. In representing Construct S, the defender strategy questions are reverse-coded. Therefore, in describing Construct S, a high score represents a prospector strategy and a low score represents a defender strategy on the scale after reverse-coding.

Construct B has strategic control or financial control alternatives that describe the Board's Control Role Type. Survey questions 25-27 describe strategic control where 7 is a high score and agrees and 1 is a low score and disagrees. Survey questions 28-30 describe financial control where 7 is a high score and agrees and 1 is a low score and disagrees. In representing Construct B, the financial control questions are reverse-coded. Therefore, in describing Construct B, a high score represents a strategic control and a low score represents a financial control on the scale after reverse-coding.

Construct I has drivers of outcomes or outcomes alternatives that describe the Information Attributes. Survey questions 1-4, 10, 12, 14, and 42 describe driver of outcomes where 7 is a high score and agrees and 1 is a low score and disagrees. Survey questions 5-9, 11, 13, and 41 describe outcomes where 7 is a high score and agrees and 1 is a low score and disagrees. In representing Construct I, the outcomes questions are reverse-coded. Therefore, in describing Construct I, a high score represents drivers of outcomes and a low score represents outcomes on the scale after reverse-coding.

Table 5.2 Naming the Independent Variables for SPSS

	Information Attributes			
Question Number	**Survey Question**	**Information Attributes measured**	**Naming in SPSS**	**Source**
Section A	Please indicate to what extent your Board draws on the following **financial** information:			
Q1	Sales growth	Driver Financial Information	InfoFinD1	Kaplan, R. S. and D. P. Norton (1996)
Q2	Sales in new markets and to new customers and/or Sales from new products and services	Driver Financial Information	InfoFinD2	Kaplan, R. S. and D. P. Norton (1996)
Q3	Investment and spending levels in for e.g. product and process development (R&D), systems and employee capabilities	Driver Financial Information	InfoFinD3	Kaplan, R. S. and D. P. Norton (1996)
Q4	Investment in the establishment of new marketing, sales and distribution channels	Driver Financial Information	InfoFinD4	Kaplan, R. S. and D. P. Norton (1996)
Q5	Traditional Measures such as Return on Capital Employed, operating income, gross margins etc	Outcome Financial Information	InfoFinO5	Kaplan, R. S. and D. P. Norton (1996)
Q6	Traditional measures for investment projects e.g. Discounted Cash flow and Capital Budgeting Analysis	Outcome Financial Information	InfoFinO6	Kaplan, R. S. and D. P. Norton (1996)
Q7	Cash Flow	Outcome Financial Information	InfoFinO7	Kaplan, R. S. and D. P. Norton (1996)
Q8	Asset utilisation for e.g. working capital ratios, paybacks and throughput	Outcome Financial Information	InfoFinO8	Kaplan, R. S. and D. P. Norton (1996)
Section B	Please indicate to what extent your Board draws on the following **customer/client** information:			
Q9	Customer/client satisfaction measures	Outcome Customer Information	InfoCstO9	Kaplan, R. S. and D. P. Norton (1996)
Q10	Image and reputation dimensions which enables the company to pro-actively define itself for its customers e.g. brand equity	Driver Customer Information	InfoCstD10	Kaplan, R. S. and D. P. Norton (1996)
Q11	Customer/client acquisition measures	Outcome Customer Information	InfoCstO11	Kaplan, R. S. and D. P. Norton (1996)
Q12	Product/service attributes (encompass the functionality of the product /service, its price, its uniqueness, and its quality)	Driver Customer Information	InfoCstD12	Kaplan, R. S. and D. P. Norton (1996)
Q13	Customer/client retention measures	Outcome Customer Information	InfoCstO13	Kaplan, R. S. and D. P. Norton (1996)
Q14	Customer/client relationship dimension (includes product/service delivery e.g. convenience, trust and response)	Driver Customer Information	InfoCstD14	Kaplan, R. S. and D. P. Norton (1996)
Section F				
Q41	To what extent can the information your Board receives be described as “outcomes” which is characterised as objective, financial, feedback and after the event type information	Outcome "direct"	InfoO41	Not applicable
Q42	To what extent can the information your Board receives be described as “drivers of outcomes” which is characterised as subjective, behavioural, feed-forward and before the event type information	Driver "direct"	InfoD42	Not applicable

Board Control Role

Question Number	Survey Question	Board Strategic Role measured	Naming in SPSS	Source
Section D	Please indicate to what extent you agree with the following statements:			
Q25	The board shapes the **context** of strategy by setting the conditions under which the strategy process happens in the organisation	Strategic Board	BrdStrt25	Hendry, K. and G. C. Kiel (2004)
Q26	The board shapes the **content** of strategy by requiring that management justify their intentions, by evaluating alternatives and by continuously monitoring progress during formulation and assessment stage	Strategic Board	BrdStrt26	Hendry, K. and G. C. Kiel (2004)
Q27	The board shapes the **conduct** of strategy by continuously monitoring implementation and results and by making changes where appropriate	Strategic Board	BrdStrt27	Hendry, K. and G. C. Kiel (2004)
Q28	The board sets financial targets only and takes strategic decisions relative to these financial targets by approving, rejecting or referring strategic proposals back to management	Financial Board	BrdFin28	Hendry, K. and G. C. Kiel (2004)
Q29	The board exerts influence over management at formal board meetings after resources have been committed and spending approved	Financial Board	BrdFin29	Hendry, K. and G. C. Kiel (2004)
Q30	The board evaluates management on the financial results of the firm	Financial Board	BrdFin30	Hendry, K. and G. C. Kiel (2004)

Firm Strategy

Question Number	Survey Question	Firm Strategy measured	Naming in SPSS	Source
Section F	Please indicate to what extent you agree with the following statements:			
Q35	Our firm's strategy does not aggressively pursue markets but finds and maintains a relatively stable and secure market	Defender/Conservative	StrtDC35	Langfield-Smith, K. (1997)
Q36	Our firm's strategy is to expand into new markets, stimulate new opportunities and obtain additional market share	Prospector/Entrepreneur	StrtPE36	Langfield-Smith, K. (1997)
Q37	Operations (e.g. production and engineering efficiency)	D/C Org Function	StrtDC37	Langfield-Smith, K. (1997)
Q38	Finance	D/C Org Function	StrtDC38	Langfield-Smith, K. (1997)
Q39	Marketing	P/E Org Function	StrtPE39	Langfield-Smith, K. (1997)
Q40	Research and development	P/E Org Function	StrtPE40	Langfield-Smith, K. (1997)

Table 5.3 Naming the Board Control Role Contingency Variables for SPSS

	Environmental Uncertainty			
Question Number	**Survey Question**	**Environmental Uncertainty measured**	**Naming in SPSS**	**Source**
Section C	How intense is each of the following in your industry?			
Q15	Bidding for purchases or raw materials	Environmental Uncertainty	BrdEU15	Gordon, L. A. and V. K. Narayanan (1984)
Q16	Competition for manpower	Environmental Uncertainty	BrdEU16	Gordon, L. A. and V. K. Narayanan (1984)
Q17	Price competition	Environmental Uncertainty	BrdEU17	Gordon, L. A. and V. K. Narayanan (1984)
Q18	How many new products and/or services have been marketed during the past 5 years by your industry?	Environmental Uncertainty	BrdEU18	Gordon, L. A. and V. K. Narayanan (1984)
	How stable/dynamic is the external environment (economic and technological) facing your firm?			
Q19	Economic	Environmental Uncertainty	BrdEU19	Gordon, L. A. and V. K. Narayanan (1984)
Q20	Technological	Environmental Uncertainty	BrdEU20	Gordon, L. A. and V. K. Narayanan (1984)
Q21	How would you classify the market activities of your *competitors* during the past 5 years?	Environmental Uncertainty	BrdEU21	Gordon, L. A. and V. K. Narayanan (1984)
Q22	During the past 5 years, the tastes and preferences of your *customers* have become	Environmental Uncertainty	BrdEU22	Gordon, L. A. and V. K. Narayanan (1984)
Q23	During the past 5 years, the legal, political and economic constraints surrounding your firm have	Environmental Uncertainty	BrdEU23	Gordon, L. A. and V. K. Narayanan (1984)
Q24	How often do new technological advances emerge in your industry?	Environmental Uncertainty	BrdEU24	Gordon, L. A. and V. K. Narayanan (1984)
	Information Asymmetry			
Question Number	**Survey Question**	**Information Asymmetry measured**	**Naming in SPSS**	**Source**
Section E				
Q31	In general, the information available to the board is very reliable	Information Asymmetry	BrdIA31	Rutherford, M. A. and A. K. Buchholtz (2007)
Q32	In general, the available information is relevant to the board's needs	Information Asymmetry	BrdIA32	Rutherford, M. A. and A. K. Buchholtz (2007)
Q33	In general, the board receives information in a timely fashion	Information Asymmetry	BrdIA33	Rutherford, M. A. and A. K. Buchholtz (2007)
Q34	At a typical board meeting, the board actively probes for information necessary to carry out their duties	Information Asymmetry	BrdIA34	Rutherford, M. A. and A. K. Buchholtz (2007)

Board Power

Question Number	Archival data measuring board power		Naming in SPSS	Source
N/A	Tenure		TenR	Zajac, E. J. and J. D. Westphal (1996)
N/A	Duality		Dual	Zajac, E. J. and J. D. Westphal (1996)
N/A	Co-optation		Coopt	Zajac, E. J. and J. D. Westphal (1996)
N/A	Composition		Comp	Zajac, E. J. and J. D. Westphal (1996)
N/A	Share Ownership		ShareOwn	Zajac, E. J. and J. D. Westphal (1996)

Table 5.4 Naming the Dependent Variables for SPSS

Dependent Variables measured in the Survey	Relative Variable Named in SPSS	Source
Composite index of firm performance		
Return on Assets 08	ROA08	Muth, M. M. and L. Donaldson (1998)
Return on Assets 09	ROA09	Muth, M. M. and L. Donaldson (1998)
Return on Equity 08	ROE08	Muth, M. M. and L. Donaldson (1998)
Return on Equity 09	ROE09	Muth, M. M. and L. Donaldson (1998)
EBIT 08	EBIT08	Muth, M. M. and L. Donaldson (1998)
EBIT 09	EBIT09	Muth, M. M. and L. Donaldson (1998)
Revenue Growth 08	RevGrth08	Muth, M. M. and L. Donaldson (1998)
Revenue Growth 09	RevGrth09	Muth, M. M. and L. Donaldson (1998)
Shareholder Returns 3yr	SHRet3yr	Muth, M. M. and L. Donaldson (1998)
Shareholder Returns 1yr	SHRet1yr	Muth, M. M. and L. Donaldson (1998)
Return on Investments 08	ROI08	Muth, M. M. and L. Donaldson (1998)
Return on Investments 09	ROI09	Muth, M. M. and L. Donaldson (1998)

5.2 CHARACTERISTICS OF THE VARIABLES

Descriptive statistics of the independent variables are presented in the same groupings as Tables 5.2 and 5.3 and are summarised in Tables 5.5 and 5.6 respectively. Normal distribution properties of the variables, though not an important consideration when using exploratory factor analysis[4], are presented. Tables 5.5 and 5.6 also illustrate skewness and kurtosis statistics; however, as exploratory factor analysis is used to summarise the relationships in the set of observed variables, assumptions regarding the distributions of variables are not enforced (Tabachnick & Fidell, 2007). Natural logarithmic transformations to correct extreme skewness and kurtosis had no effect in the eventual regression analysis, and as a result, the untransformed variables were retained.

[4] Limitations apply with greater force to confirmatory analysis. (Tabachnick & Fidell, 2007) Pg 588.

Table 5.5 Descriptive Statistics: Variables I, B and S

Variable	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance	Skewness	Kurtosis
InfoFinD1	134	6	1	7	585	4.37	2.306	5.316	-.408	-1.420
InfoFinD2	133	6	1	7	569	4.28	2.068	4.278	-.443	-1.181
InfoFinD3	133	6	1	7	594	4.47	1.893	3.584	-.430	-.849
InfoFinD4	132	6	1	7	539	4.08	2.042	4.169	-.218	-1.308
InfoFinO5	134	6	1	7	369	2.75	1.866	3.480	1.156	.281
InfoFinO6	135	6	1	7	352	2.61	1.635	2.673	1.132	.669
InfoFinO7	136	6	1	7	218	1.60	1.070	1.145	2.765	9.541
InfoFinO8	133	6	1	7	392	2.95	1.563	2.444	.861	.306
InfoCstO9	133	6	1	7	507	3.81	1.962	3.851	.383	-1.117
InfoCstD10	133	6	1	7	622	4.68	1.743	3.039	-.624	-.440
InfoCstO11	131	6	1	7	525	4.01	2.006	4.023	.233	-1.249
InfoCstD12	131	6	1	7	580	4.43	1.992	3.970	-.537	-.979
InfoCstO13	133	6	1	7	487	3.66	2.007	4.029	.441	-1.080
InfoCstD14	132	6	1	7	578	4.38	2.051	4.207	-.529	-1.026
BrdStrt25	129	6	1	7	692	5.36	1.463	2.140	-1.036	.759
BrdStrt26	130	6	1	7	731	5.62	1.163	1.353	-1.384	2.610
BrdStrt27	130	6	1	7	705	5.42	1.281	1.641	-1.062	1.425
BrdFin28	130	6	1	7	585	4.50	1.740	3.027	-.318	-.846
BrdFin29	128	6	1	7	442	3.45	1.626	2.643	.431	-.531
BrdFin30	128	6	1	7	340	2.66	1.337	1.786	1.076	1.410
StrtDC35	119	6	1	7	529	4.45	1.686	2.842	-.222	-.884
StrtPE36	119	6	1	7	628	5.28	1.551	2.405	-1.154	.854
StrtDC37	125	6	1	7	272	2.18	1.503	2.259	1.809	2.884
StrtDC38	128	6	1	7	261	2.04	1.111	1.235	1.461	2.887

StrtPE39	125	6	1	7	628	5.02	1.816	3.298	-.948	-.137
StrtPE40	127	6	1	7	561	4.42	1.904	3.626	-.260	-1.024
InfoO41	125	5	1	6	358	2.86	1.180	1.393	.358	-.286
InfoD42	125	5	2	7	579	4.63	1.202	1.444	-.246	-.413
Valid N (listwise)	112									

Table 5.6 Descriptive Statistics: Board Control Role Contingency Variables

Variable	N	Range	Minimum	Maximum	Sum	Mean	Std. Deviation	Variance	Skewness	Kurtosis
BrdEU15	131	6	1	7	439	3.35	1.937	3.753	.271	-1.126
BrdEU16	132	6	1	7	619	4.69	1.681	2.826	-.653	-.375
BrdEU17	131	6	1	7	623	4.76	1.869	3.494	-.714	-.486
BrdEU18	128	6	1	7	457	3.57	2.057	4.231	.215	-1.184
BrdEU19	133	5	2	7	709	5.33	1.248	1.556	-.510	-.039
BrdEU20	133	6	1	7	603	4.53	1.530	2.342	-.052	-.809
BrdEU21	125	6	1	7	482	3.86	1.318	1.737	-.031	-.263
BrdEU22	122	5	1	6	516	4.23	1.205	1.451	-1.204	1.461
BrdEU23	128	6	1	7	660	5.16	1.594	2.542	-.781	.144
BrdEU24	129	6	1	7	544	4.22	1.705	2.906	-.057	-1.032
BrdIA31	130	5	2	7	749	5.76	1.055	1.113	-1.116	1.587
BrdIA32	130	5	2	7	745	5.73	.963	.927	-.863	1.304
BrdIA33	129	6	1	7	729	5.65	1.150	1.323	-1.254	2.096
BrdIA34	130	6	1	7	746	5.74	1.158	1.342	-1.417	2.709
TenR	137	1506.348	.152	1506.500	2582.819	18.85269	140.691611	19794.129	9.596	96.751
Dual	137	1.000	.000	1.000	126.000	.91971	.272742	.074	-3.123	7.870
Coopt	137	.860	.000	.860	34.460	.25153	.260672	.068	.574	-.960
Comp	137	.890	.000	.890	83.130	.60679	.186212	.035	-.847	.429
ShareOwn	137	3.334	.000	3.334	12.919	.09430	.339108	.115	7.423	64.455
Valid N (listwise)	119									

5.3 DEVELOPING THE FACTORS

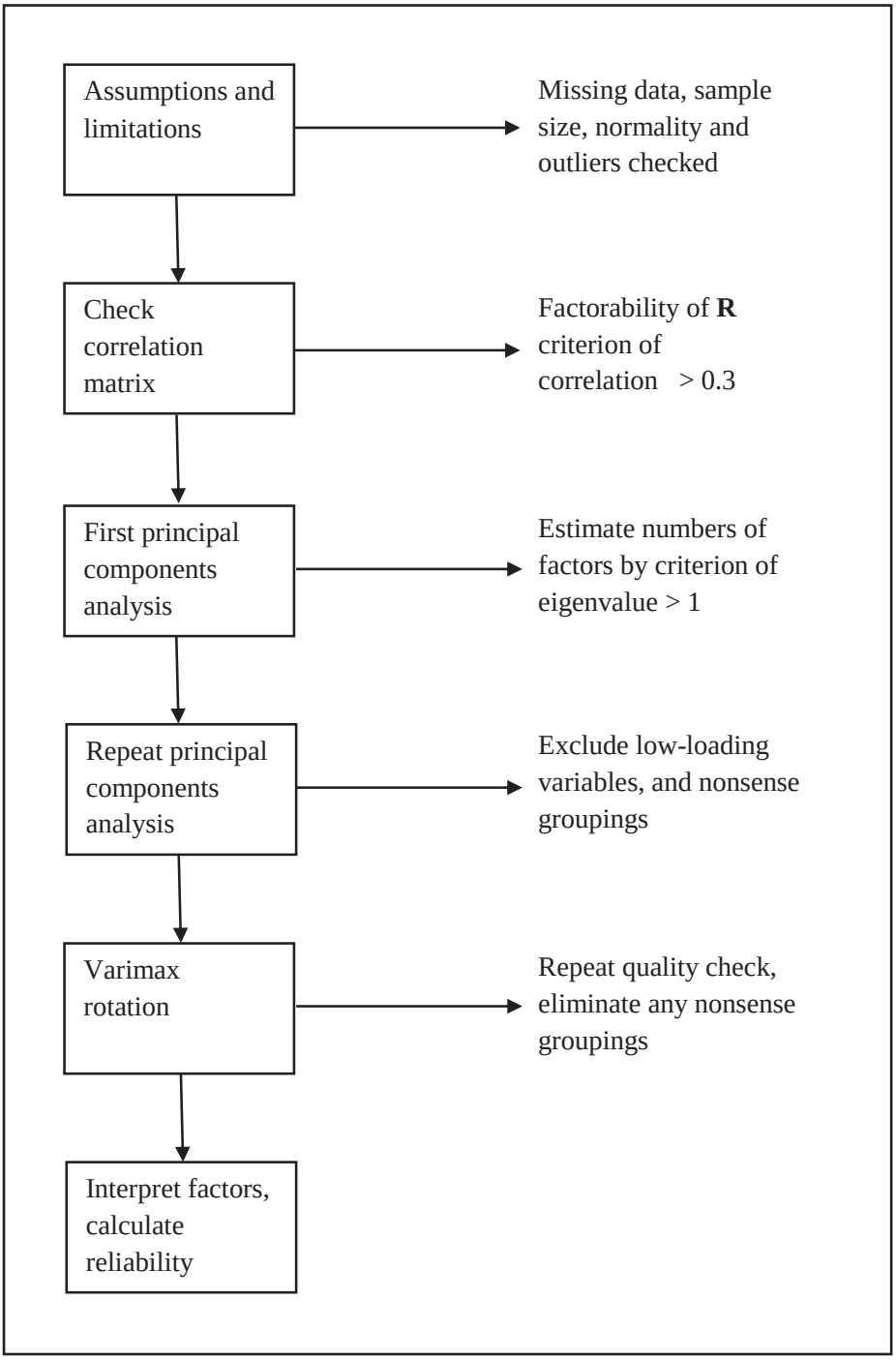
There are two types of factor analyses: exploratory and confirmatory. In this research, exploratory factor analysis is used, as the goal is to summarise patterns of correlation and to reduce a large number of observed variables to a smaller number of factors. Tabachnick and Fiddell (2007) suggest factor analysis reveals patterns of correlation among variables that are thought to reflect the underlying processes affecting behaviour. In addition, because the number of factors is usually far fewer than the number of observed variables, there is considerable parsimony in using factor analysis (Tabachnick & Fidell, 2007).

It is acknowledged that confirmatory factor analysis performed through structural equation modelling (SEM) has advantages over regression analysis and advances the theoretical development of Management Accounting (Baines & Langfield-Smith, 2003). However, SEM was rejected due to the very large sample size required and the fact that this research is exploratory in its nature. Factor analysis is used to determine if the independent variables that are correlated with each other break down into smaller sets of independent related data. In addition, to determine a Composite Index of Firm Performance (Muth & Donaldson, 1998), factor analysis is performed on the dependent variables. This section is divided into two parts: Section 5.3.1 is the factor analysis of the independent variables and Section 5.3.2 is the factor analysis of the dependent variables.

5.3.1 Independent Variables

Exploratory factor analysis is used to reduce the 47 independent variables in Tables 5.2 and 5.3. The goal is to summarise and describe groups of variables that are correlated. The aim in this research is to identify an independent variable that will plausibly represent each of the three constructs in the hypothesised interaction and an independent variable that will represent each of the three contingencies. The steps involved in the process of factor analysis are illustrated in Figure 5.1.

Figure 5.1 Factor Analysis Process



Assumptions and Limitations

Missing Data and Sample Size: All variables were examined for out-of-range and missing responses. With respect to the survey data (refer to Table 5.5), all ranges are 6 where the minimum option selected is 1, and 5 where the minimum option selected is 2 on the 7-point Likert scale. The entry of the data has been re-checked where maxima (minima) were less than 7 (1). In addition, none of the sum totals exceed 1015, which is the maximum sum, notwithstanding missing data (Listwise N = 112).

The Listwise total of N = 112 in Table 5.5 and 119 in Table 5.6 is more than adequate to meet the factor analysis Rule of 100 (Gorsuch, 1983; Kline, 1979 ; MacCallum, Widaman, Zhang, & Hong, 1999). Hatcher (1994) recommended that the number of subjects should be the larger of 5 times the number of variables or 100. However, Tabachnick and Fidell (2007) suggest that loading marker variables >.80 do not require such large sample sizes and about 150 cases should be sufficient. Taking all these into account, the total of 112 in this research is adequate for exploratory factor analysis.

Normality and Outliers: As long as factor analysis is used to summarise the relationships in a large set of observed variables, assumptions regarding the distribution of variables is not essential (Tabachnick & Fidell, 2007). However, outliers have more influence on factor solutions. A number of variables did have skewness and kurtosis (refer to Tables 5.5 and 5.6). Natural logarithmic transformations to correct extreme skewness and kurtosis had no effect in the eventual regression analysis, and as a result, the untransformed variables were retained.

When performing factor analysis, univariate and multivariate outliers are identified using Mahalanobis distance among all cases simultaneously. Ten cases with the largest distance are presented on Table 5.7. Cases where the critical value is measured at (χ^2 (47) = 82.72 p < .001), as per the critical values of chi-square table measured at 47 degrees of freedom, are regarded as outliers. Only one case, number 67, exceeds the value of 82.72. Upon investigation, case 67 revealed no mistake in data entry. Further analysis revealed that removing or including the case did not affect the factor analysis solution and it was

retained.

Table 5.7 Independent Variable Outlier Statistic

Mahal. Distance	Case Number	Statistic
1	67	94.89756
2	118	77.28526
3	68	74.82849
4	86	68.89045
5	72	67.69599
6	122	66.10093
7	16	65.69961
8	38	65.3556
9	47	63.83065
10	55	62.71939

Correlation Matrix

The results of a bivariate Pearson product-moment correlation of the 42 survey questions and 5 board power variables were examined (refer to Excel Appendix 5B) and revealed that 46 of the 47 variables correlate at above 0.3 or **significant at the 0.01 level (2-tailed). In addition 41 of the 47 variables correlated with at least .3 on at least one other variable, suggesting factorability would be likely. The Kaiser-Meyer-Olkin measure of sampling adequacy was .789, which is above the recommended value of .6. The Bartlett's test of sphericity was significant at (χ^2 (253) = 1547.849, $p < .001$). All the communalities are above .5 and 40 of the 47 diagonals of the anti-imaging correlation matrix were all over .5, supporting the inclusion of each variable in the factor analysis. Given these measures, factor analysis was conducted with all 47 variables.

First Principal Components Analysis

An initial factor analysis was carried out where the rule of thumb in selecting the number of factors is an eigenvalue greater than 1 and a visual confirmation of scree plot (Tabachnick & Fidell, 2007). Principal component analysis was used to reduce the 47 observed variables to a smaller number of factors to operationalise the hypothesised independent variables. Consistent with the process described by Tabachnick and Fiddell (2007), the research proceeded using principal components extraction and varimax rotation.

Repeat Principal Components Analysis and Varimax Rotation

A total number of 12 variables failed to meet a minimum criterion of having a factor loading of .4 or above and were eliminated during the first three varimax rotation steps. These variables, in order, are survey question numbers 22, 8, 30, 42, 41, 29, 18, 34, 7, 37, 21 and 15. A further 12 variables had either cross loading or are single variables and did not contribute to the loading solution. These variables are survey questions 17, 39, 6, 1, 5, 10, 30, 28, 19, 38, “Dual” and “ShareOwn” and were therefore deleted from the factor analysis, leaving a total of 23 of the original 47 in the factor solution.

A seven-factor solution, which cumulatively explained 75.3% of the variance, was ultimately selected using a cut-off at eigenvalues > 1 and is illustrated on the scree plot, showing seven factors. The communalities, explanation of the total variance, and scree plot are exhibited in Tables 5.8A, 5.8B and Figure 5.2 respectively.

With no prior research in this area, as supported by the literature review, the seven-factor loading solutions (refer to Table 5.9) were subsequently labelled in order as:

- I (as information attributes)
- assy (as information asymmetry)
- B (as board control)
- eu1 (as technological environmental uncertainty)
- eu2 (as economic environmental uncertainty)
- power (as board power)
- S (as firm strategy)

The final seven-factor loading solution is presented in Table 5.9 and the reliability and interpretation of each construct I, B, and S follows.

Table 5.8A Communalities of the Seven-Factor Solution

Communalities		
Variables	**Initial**	**Extraction**
BrdEU16	1.000	.694
BrdEU20	1.000	.810
BrdEU23	1.000	.755
BrdEU24	1.000	.762
BrdIA31	1.000	.874
BrdIA32	1.000	.872
BrdIA33	1.000	.759
TenR	1.000	.558
Coopt	1.000	.689
Comp	1.000	.590
InfoFinD2	1.000	.705
InfoFinD3	1.000	.709
InfoFinD4	1.000	.711
InfoCstO9	1.000	.781
InfoCstO11	1.000	.768
InfoCstD12	1.000	.877
InfoCstO13	1.000	.848
InfoCstD14	1.000	.819
BrdStrt25	1.000	.690
BrdStrt26	1.000	.774
BrdStrt27	1.000	.783
StrtDC35	1.000	.748
StrtPE36	1.000	.734
Extraction Method: Principal Component Analysis.		

Table 5.8B Total Variance Explanation of the Seven-Factor Solution

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cum %	Total	% of Variance	Cum %	Total	% of Variance	Cum %
1	6.526	28.374	28.374	6.526	28.374	28.374	6.007	26.118	26.118
2	3.169	13.779	42.153	3.169	13.779	42.153	2.580	11.216	37.333
3	2.001	8.700	50.853	2.001	8.700	50.853	2.281	9.919	47.253
4	1.638	7.124	57.977	1.638	7.124	57.977	1.753	7.621	54.873
5	1.552	6.748	64.725	1.552	6.748	64.725	1.597	6.944	61.818
6	1.309	5.693	70.418	1.309	5.693	70.418	1.583	6.884	68.701
7	1.115	4.849	75.267	1.115	4.849	75.267	1.510	6.566	75.267
8	.770	3.348	78.615						
9	.670	2.913	81.528						
10	.607	2.641	84.169						
11	.571	2.485	86.653						
12	.477	2.074	88.727						
13	.459	1.996	90.723						
14	.384	1.668	92.391						
15	.348	1.512	93.903						
16	.289	1.257	95.160						
17	.241	1.047	96.207						
18	.231	1.005	97.212						
19	.194	.845	98.057						
20	.136	.590	98.647						
21	.124	.541	99.188						
22	.098	.428	99.616						
23	.088	.384	100.000						

Extraction Method: Principal Component Analysis.

Figure 5.2 Scree Plot of the Seven-Factor Solution

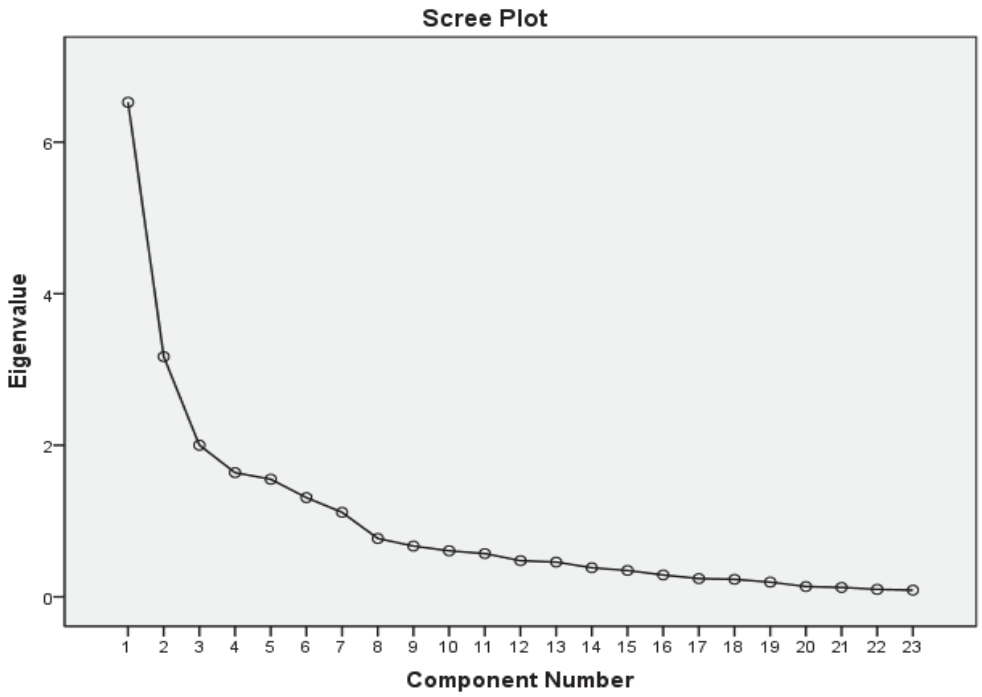


Table 5.9 Final Seven-Factor Loading Matrix

Rotated Component Matrix[a]							
	Component						
Variables	**I**	**assy**	**B**	**eu1**	**S**	**power**	**eu2**
InfoCstD12	**.931**	-.004	.003	.042	.088	.017	.028
InfoCstO13	**-.917**	.035	-.032	-.046	-.044	-.024	-.028
InfoCstD14	**.898**	-.041	-.002	-.005	-.048	.041	.078
InfoCstO9	**-.870**	.049	-.078	-.048	-.037	-.021	-.111
InfoCstO11	**-.867**	.066	-.084	-.037	.037	-.021	-.043
InfoFinD2	**.794**	.009	.009	.158	.138	.168	-.050
InfoFinD4	**.790**	-.055	.140	.191	.145	.080	-.001
InfoFinD3	**.678**	-.121	.211	.220	.371	-.061	-.035
BrdIA31	-.084	**.919**	.078	.076	-.065	-.019	-.080
BrdIA32	-.107	**.910**	.108	.048	-.002	-.129	-.046
BrdIA33	-.039	**.827**	.213	.111	.068	.097	.053
BrdStrt27	.133	.153	**.853**	-.004	.057	-.056	-.089
BrdStrt25	.018	.013	**.821**	.021	-.048	.017	.116
BrdStrt26	.166	.266	**.813**	-.004	-.107	-.006	.056
BrdEU24	.097	.126	.046	**.837**	.157	-.087	.049
BrdEU20	.305	.104	-.019	**.832**	-.067	.094	.027
StrtDC35	.036	-.059	-.173	.084	**.821**	.104	-.148
StrtPE36	.252	.068	.061	-.006	**.812**	.006	.064
Coopt	.120	-.162	-.033	.064	.033	**.793**	-.115
TenR	.003	.017	.111	-.319	.034	**.665**	.004
Comp	.102	.143	-.158	.275	.053	**.630**	.243
BrdEU23	.011	.049	.035	-.080	.022	.100	**.857**
BrdEU16	.120	-.133	.051	.169	-.110	-.079	**.783**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Interpreting Factors and Calculating Reliability

The goal of this analysis was to determine the variables for the constructs: I, B and S and to determine the board control contingencies: environmental uncertainty, information asymmetry and board power.

Reliability – Chronbach's Alpha: The source of items for the Constructs I, B and S are the 28 survey questions in Table 5.2. Factor analysis measures the underlying constructs in checking dimensionality of the items: however, Cronbach's alpha measures internal consistency and has a relationship with factor analysis (Zinbarg, et al., 2005). Where a high alpha measurement is evident (rule of thumb: "_ > .9 – Excellent, _ > .8 – Good, _ > .7 – Acceptable, _ > .6 – Questionable, _ > .5 – Poor, and _ < .5 – Unacceptable" (George & Mallery, 2003)), the variables that loaded in the factors are averaged to determine the Constructs I, B, and S.

The Constructs

Construct I measures Information Attributes and is named I in the seven-factor solution (refer to Table 5.9). It is derived from 16 (questions 1-4, 41, and 42) of the 28 survey questions (refer to Table 5.2). Eight of the 16 survey questions, namely questions 2-4, 9, 11, and 12-14 (refer to Table 5.2 for the full questions) load on to variable I and has a Cronbach's alpha of 0.945. The 8 questions' scores are averaged to determine variable I. The descriptive statistics of variable I are presented in Table 5.11. A high score measures drivers of outcomes and a low score measures outcomes.

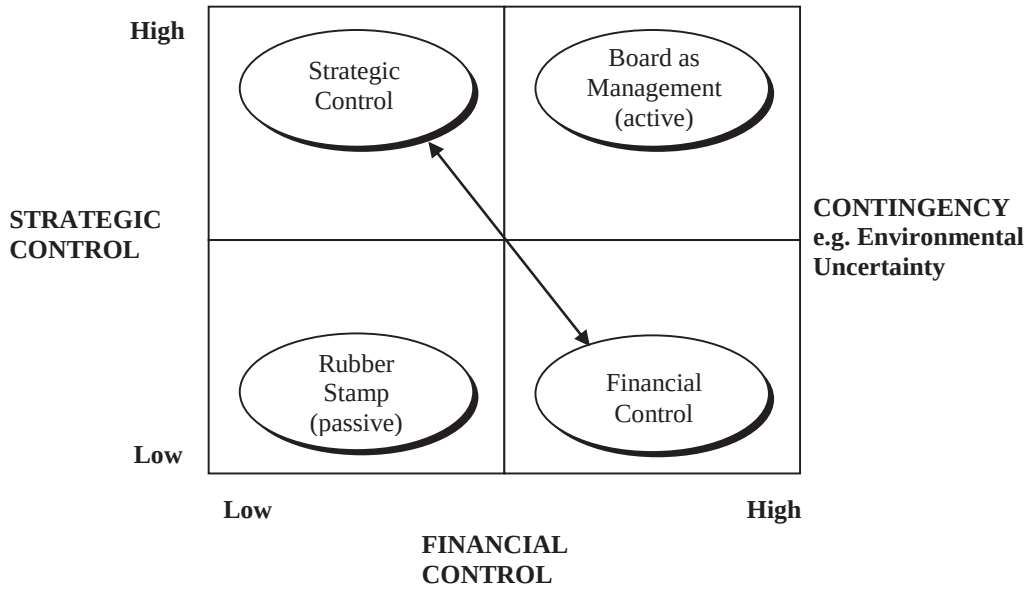
Construct S measures the firm's Strategic Configuration and is named S in the seven-factor solution (refer to Table 5.9). It is derived from 6 (questions 35-40) of the 28 survey questions (refer to Table 5.2). Two of the 6 survey questions, namely questions 35 and 36 (refer to Table 5.2 for the full questions), load on to variable S and has a Cronbach's alpha of 0.621. The 2 questions' scores are averaged to determine variable S. The descriptive statistics of variable S are presented in Table 5.11. A high score measures prospector strategies and a low score measures defender strategies.

Construct B measures the Board's Control Role Type and is named B in the seven-factor solution (refer to Table 5.9). It is derived from 6 (questions 25-30) of the 28 survey questions (refer to Table 5.2). Three of the 6 survey questions, namely questions 25-27 (refer to Table 5.2 for the full questions), load on to variable B and have a Cronbach's alpha of 0.794. The 3 questions' scores are averaged to determine variable B. The descriptive statistics of variable B are presented in Table 5.11. A high score measures strategic control and a low score measures financial control.

The Board Contingencies

Notable in Table 5.9 is that no financial control board survey questions (questions 28-30) load on construct B. Figure 5.3 represents the Hendry and Kiel (2004) typology and suggests, in the top right quadrant, that boards that exercise both financial and strategic control are termed 'Board as Management', as opposed to 'Rubber Stamp Board' that exercise low levels of any controls.

Figure 5.3 Proposed Board Control Typology (Hendry & Kiel 2004, p. 512)



Further analysis of the variables, in a bivariate Pearson product-moment correlation, that represent strategic and financial control (refer to Table 5.10) confirms that a significant positive correlation exists among the three Board Control Role variables: BrdStrt25, BrdStrt26 and BrdStrt27. It is **significant at the 0.01 level (2-tailed) and has a Cronbach's alpha of .803. In addition, the output confirms a positive relationship between two board financial role variables: BrdFin29 and BrdFin30 (**significant at the 0.01 level (2-tailed)) and a Cronbach's alpha of .5. (The non-relevance of the BrdFin28 variable is attributed in retrospect to unclear wording of the survey question. The wording "the board sets financial targets **only**" probably created confusion in imposing an improbable constraint).

Table 5.10 Board Control Role Correlation Matrix

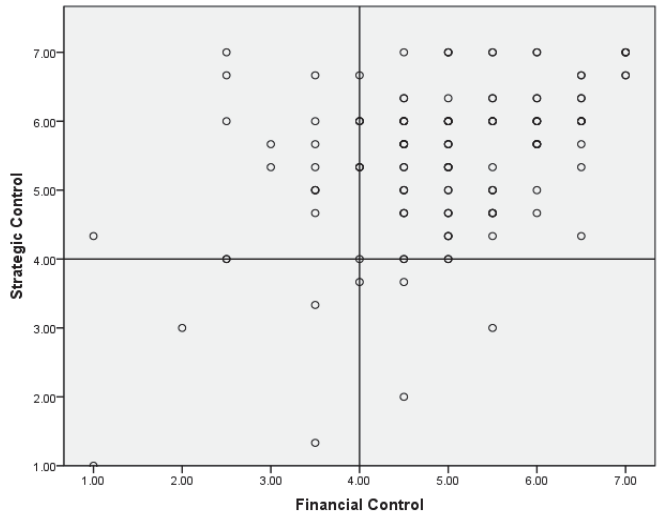
		BrdStrt25	BrdStrt26	BrdStrt27	BrdFin28	BrdFin29	BrdFin30
BrdStrt25	Pearson Correlation	1	.563**	.513**	.092	.300**	.191*
	Sig. (2-tailed)		.000	.000	.287	.000	.028
	N	135	135	135	135	133	133
BrdStrt26	Pearson Correlation	.563**	1	.668**	.030	.262**	.352**
	Sig. (2-tailed)	.000		.000	.728	.002	.000
	N	135	136	136	136	134	134
BrdStrt27	Pearson Correlation	.513**	.668**	1	.029	.370**	.269**
	Sig. (2-tailed)	.000	.000		.734	.000	.002
	N	135	136	136	136	134	134
BrdFin28	Pearson Correlation	.092	.030	.029	1	.135	.225**
	Sig. (2-tailed)	.287	.728	.734		.120	.009
	N	135	136	136	136	134	134
BrdFin29	Pearson Correlation	.300**	.262**	.370**	.135	1	.293**
	Sig. (2-tailed)	.000	.002	.000	.120		.001
	N	133	134	134	134	134	134
BrdFin30	Pearson Correlation	.191*	.352**	.269**	.225**	.293**	1
	Sig. (2-tailed)	.028	.000	.002	.009	.001	
	N	133	134	134	134	134	134

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Figure 5.4 superimposes these results into the typology in Figure 5.3 by averaging the board control scores. It shows, at a score above 3, that 99% of the boards surveyed agree to their 'Board as Management' role. Further analysis reveals that none of the boards in the survey sampled regarded themselves as 'Rubber Stamp Boards' and that only one (based on a score lower than 3) regarded itself as a financial control board. The results of the survey suggest that in this sample, board chairs consider themselves to be a 'Board as Management' control role, as proposed by the Hendry and Kiel (2004) typology.

Figure 5.4 Strategic and Financial Control Variables Superimposed into the (Hendry & Kiel 2004) Typology



Board Control Contingencies:

Having determined the board control role as 'Board as Management' above, further post hoc exploration in Appendix 5C will explore the indirect impact that the contingent variables: environmental uncertainty, information asymmetry, and board power have on the board control role. The contingent variables are the balance of the factors in Table 5.8 "assy," "eu1," "eu2," and "power".

In summary, the analysis performed on the independent variables determines the three constructs, I, B, and S, to be represented in the hypothesised interaction, which will be tested in Chapter 6. Twenty-four of the 47 variables were eliminated. Evidence of approximately normal distributions (refer to Table 5.10) suggests the variables are appropriate for multiple regression analysis, although their preceding observation of boards as management may be unintended impacts on any findings.

Table 5.11 Descriptive Statistics: B, S and I

Variable	N	Min	Max	Mean	Std. Deviation	Skewness	Kurtosis	Cronbach Alpha
B	129	1.00	7.00	5.4651	1.10115	-1.298	2.906	.794
S	119	1.00	7.00	4.8613	1.37921	-.731	.553	.621
I	128	1.00	7.00	4.2451	1.70531	-.578	-.919	.945
Valid N (listwise)	115							

5.3.2 Dependent Variables

Consistent with Muth and Donaldson (1998) and Hamilton and Shergill (1992), the basis of determining the Composite Index of Firm Performance, which is used as the dependent variable, is the factor analysis of: accounting returns, sales growth, and market returns over periods one and three years respectively. Four measures, namely return on assets (ROA), return on equity (ROE), return on investment (ROI), and earnings before interest and tax (EBIT), totalling eight variables, represent accounting returns. A three-year shareholder return and a one-year shareholder return represent the two market returns, and sales growth last year and sales growth this year represent sales growth. The data is sourced from the 2008 and 2009 annual reports. A total of 12 variables were submitted for factor analysis.

The results of a bivariate Pearson product-moment correlation of the 12 variables were examined (refer to Excel Appendix 5D) and revealed that all of the 12 variables correlate at least .3 on at least one other

variable, suggesting reasonable factorability. In addition, the communalities were all above .6, except RevGrth08 and 09, which are above .4, further confirming that all the variables shared common variance with other variables. The Kaiser-Meyer-Olkin measure of sampling adequacy was .667, which is above the recommended value of .6. The Barlett's test of sphericity was significant at (χ^2 (66) = 935.129, p < .001) and all the diagonals of the anti-image correlation matrix except RevGrth08 and RevGrth09 were over .5. Given these measures, factor analysis was conducted with all 12 variables.

Multivariate outliers are identified using Mahalanobis distance among all cases simultaneously. Ten cases with the largest distance are presented in Table 5.11. Cases where the critical value is measured at (χ^2 (12) = 32.909 p < .001) are regarded as outliers. Mahalanobis distance identified eight multivariate outliers, which were examined. Further examination revealed that, unlike the independent variables, the eight cases were extreme outliers and were deleted.

Table 5.12 Dependent Variable Outlier Statistic

Mahal. Distance	Case	Statistic
1	77	74.90819
2	92	74.49877
3	54	73.49294
4	106	73.29733
5	100	66.19534
6	98	52.13447
7	126	44.10425
8	79	37.46631
9	97	29.39781
10	108	26.82037

Principal components analysis using varimax rotation was used to reduce the 12 variables into a smaller number of factors. One varimax rotation resulted in a four-factor solution, which explained 80.1% of the cumulative variance. None of the variables were eliminated as they all contribute to the four-factor structure. The final four-factor solution's communalities, explanation of the total variance, and scree plot

are presented in Tables 5.13A and 5.13B and in Figure 5.5.

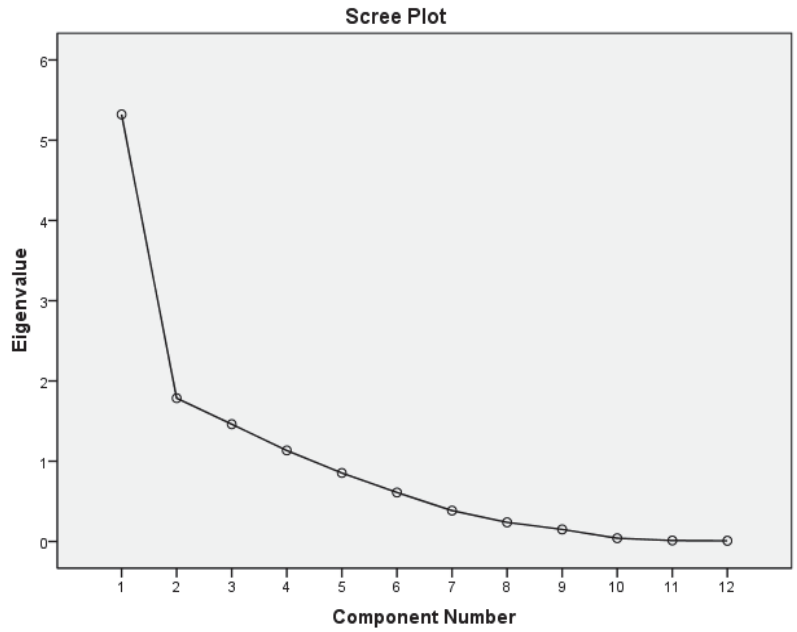
Table 5.13A Communalities of the Four-Factor Solution

Variables	Initial	Extraction
ROA08	1.000	.844
ROA09	1.000	.919
ROE08	1.000	.833
ROE09	1.000	.886
EBIT08	1.000	.991
EBIT09	1.000	.989
RevGrth08	1.000	.486
RevGrth09	1.000	.576
SHRet3yr	1.000	.848
SHRet1yr	1.000	.881
ROI08	1.000	.688
ROI09	1.000	.761
Extraction Method: Principal Component Analysis.		

Table 5.13B Total Variance Explanation of the Four-Factor Solution

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	**Total**	**% of Variance**	**Cum %**	**Total**	**% of Variance**	**Cum %**	**Total**	**% of Variance**	**Cum %**
1	5.321	44.342	44.342	5.321	44.342	44.342	4.503	37.525	37.525
2	1.786	14.881	59.223	1.786	14.881	59.223	2.072	17.266	54.791
3	1.461	12.176	71.398	1.461	12.176	71.398	1.892	15.768	70.559
4	1.134	9.451	80.849	1.134	9.451	80.849	1.235	10.290	80.849
5	.854	7.114	87.963						
6	.610	5.085	93.048						
7	.385	3.205	96.253						
8	.238	1.986	98.239						
9	.150	1.250	99.490						
10	.041	.339	99.829						
11	.012	.101	99.930						
12	.008	.070	100.000						

Figure 5.5 Scree Plot of the Four-Factor Solution



The final four-factor loading solution is presented in Table 5.14. The four-factor solution is consistent with Muth and Donaldson's (1998) three dependent variable solution to the Composite Index of Firm Performance. The only difference is an additional EBIT measure. The factors were named in the following order: acc (as the accounting measure), ebit (as the profit measure), sh (as the market measure), and rg (as the sales growth measure).

Table 5.14 Final Four-Factor Loading Matrix

Rotated Component Matrix[a]				
	Components			
Variables	**acc**	**ebit**	**sh**	**rg**
ROE09	**.925**	.115	.134	.022
ROA09	**.922**	.233	.122	.009
ROI09	**.839**	-.024	.033	.237
ROI08	**.823**	.023	.088	-.047
ROA08	**.797**	.206	.328	-.241
ROE08	**.758**	.154	.378	-.303
EBIT08	.123	**.986**	.067	.021
EBIT09	.164	**.978**	.063	.044
SHRet1yr	.099	.077	**.926**	.093
SHRet3yr	.338	.042	**.849**	.105
RevGrth09	.124	.010	.021	**.748**
RevGrth08	-.163	.044	.115	**.666**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

5.4 CHAPTER SUMMARY

This chapter used factor analysis and Cronbach's alpha to analyse the questionnaire variables that determined the independent variables I, B, and S. Factor analysis also determined the dependent variables acc, ebit, sh, and rg. The independent variables will be used to test the hypothesised interaction in Chapter 6. Twenty-four of the 47 independent variables were eliminated in exploratory factor analysis. Evidence

of approximately normal distributions (refer to Table 5.11) suggests the variables are appropriate for multiple regression analysis.

In regards to the dependent variables, four distinct factors underlie the Composite Index of Firm Performance. None of the 12 variables were eliminated and the loading is higher in comparison to the Muth and Donaldson (1998) structure. The four factors were saved as dependent variables: acc, ebit, sh and rg for multiple regression analysis.

CHAPTER 6

HYPOTHESIS TESTING

6.0 INTRODUCTION

In Chapter 3 it was hypothesised an interaction among the Board's Control Role, Strategic Configuration, and Information Attributes to be observed through the criterion variables of Firm Performance. Chapter 4 describes the development and implementation of a survey instrument to collect relevant data along with archival data. Chapter 5 documents how these data were then processed and analysed to develop constructs that statistically measure Board Control Role, Strategic Configuration, Information Attributes, and Firm Performance. Chapter 6 describes how the hypotheses developed in Chapter 3 are statistically tested and discusses the findings.

The hypotheses developed in Chapter 3 are re-stated here in their alternative form.

Hypothesis 1:

A three-way interaction among Strategic Configuration, Board Control Role Type, and Information Attributes is associated with superior Firm Performance.

Statistically: $FP = \beta0 + \beta1 (S*B*I) + \beta2 (S*B) + \beta3 (S*I) + \beta4 (B*I) + \beta5 (S) + \beta6 (B) + \beta7 (I) + r$

Should the three-way interaction hypothesis not be supported, the sample will be split into prospector and defender strategy groups, and two-way interactions will be tested as follows:

Hypotheses 2(a) and 2(b):

Prospector Group:

Prospector strategic configuration firms, whose boards choose a Strategic Control Role incorporating driver information measures, are associated with superior Firm Performance.

Statistically: $FP = \alpha 0 + \alpha 1\ (B*I) + \alpha 2\ (B) + \alpha 3\ (I) + r$

Defender Group:

Defender strategic configuration firms, whose boards choose a Financial Control Role incorporating output information measures, are associated with superior Firm Performance.

Statistically: $FP = \alpha 0 + \alpha 1\ (B*I) + \alpha 2\ (B) + \alpha 3\ (I) + r$

Hypothesis 3:

The main effects will be tested for association with superior Firm Performance.

i. Strategic Configuration is associated with superior Firm Performance.

   Statistically: $FP = \gamma 0 + \gamma 1\ (S) + r$

ii. Board Control Role type is associated with superior Firm Performance.

   Statistically: $FP = \gamma 0 + \gamma 1\ (B) + r$

iii. Information Attributes is associated with superior Firm Performance.

   Statistically: $FP = \gamma 0 + \gamma 1\ (I) + r$

Chapter 6 proceeds as follows: Section 6.1 states possible outcomes. Results of testing Hypothesis 1 are discussed in Section 6.2. Section 6.3 and Section 6.4 discuss the testing of Hypotheses 2 and 3 respectively. Section 6.5 discusses the implications of the findings and concludes the chapter.

6.1 POSSIBLE OUTCOMES

Where a higher order interaction is observed, the lower order effects, i.e. two-way interactions in this research, need not be tested. Statistics texts (Aiken & West, 1991; Tabachnick & Fidell, 2007) recommend that if the interaction is significant, the lower order effects cannot be examined meaningfully because they do not tell the complete story. Interpreting interactions and main effects in multiple regressions stipulate that the interaction should be interpreted first. If the interaction is not significant, the lower order effects can then be examined. Thus:

1. The null hypothesis for association with Firm Performance is rejected, signalling there is an association between the three-way interaction of firm Strategic Configuration, Information Attributes, and a Board's Control Role.

2. Should the null hypothesis not be rejected, then Hypotheses 2(a) and 2(b) will test a two-way interaction, by splitting the sample into Prospector and Defender groups, between Information Attributes and a Board's Control Role.

3. Hypothesis 3 will examine the three main effects.

6.2 HYPOTHESIS 1 – THE THREE-WAY INTERACTION BETWEEN S, B, AND I

Multiple regression analysis was conducted to test the hypothesis of a three-way interaction of Board Control, firm Strategic Configuration, and Information Attributes. This is expressed in the formula:

$$FP = \beta_0 + \beta_1 (S*B*I) + \beta_2 (S*B) + \beta_3 (S*I) + \beta_4 (B*I) + \beta_5 (S) + \beta_6 (B) + \beta_7 (I) + r$$

Since no a priori hypotheses have been made to determine the order of entry of the independent variables, the direct method (i.e. all variables entered simultaneously) was used in multiple regression analysis.

Seven independent variables were entered simultaneously into the analysis. They are the variables: information (I), boards (B), and strategy (S), and the three two-way interactions IB, IS, BS calculated by multiplying each variable respectively. The seventh variable is the multiplication of the three-way interaction, IBS. The independent variables are regressed in turn against each of the four dependent variables: “acc”, “ebit”, “sh” and “rg” that represent the Composite Index of Firm Performance. Tables 6.1A, 6.1B, 6.1C and 6.1D present the results demonstrated by the: variables, model summary, anova, and coefficients, by each Composite Index of Firm Performance. Discussion of the results is presented in Section 6.5.

Table 6.1A Three-way Interaction with Criterion Variable: Composite Index 'acc'

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	IBS, B, S, I, BS, IB, IS[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: acc

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.256[a]	.066	-.058	1.07648974

a. Predictors: (Constant), IBS, B, S, I, BS, IB, IS

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.312	7	.616	.532	.807[a]
	Residual	61.418	53	1.159		
	Total	65.730	60			

a. Predictors: (Constant), IBS, B, S, I, BS, IB, IS
b. Dependent Variable: acc

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.123	17.755		.007	.994
	B	-.177	3.204	-.172	-.055	.956
	S	.464	3.983	.520	.117	.908
	I	-.358	3.318	-.443	-.108	.915
	IB	.102	.594	.945	.172	.864
	IS	.014	.742	.128	.019	.985
	BS	-.037	.711	-.318	-.053	.958
	IBS	-.013	.131	-.797	-.099	.921

a. Dependent Variable: acc

The multiple correlation (R) between accounting performance “acc” (accounting returns: ROA, ROI and ROE) and the seven independent variables is not significant: .256. In addition, the combination of the seven independent variables accounts for less than 7% of the variation in accounting performance (adjusted R square): -.058. The regression equation is not significant (F 7, 53) = .532, p = .807.

Regression Weights: None of the seven independent variables has significant standardised regression weights, and none has a significant association with “acc” (accounting performance). The three-way interaction is not significant and therefore we cannot reject the null hypothesis. There is no significant association between I, B, S and accounting returns.

Table 6.1B Three-way Interaction with Criterion Variable: Composite Index 'ebit'

Variables Entered/Removed[b]			
Model	**Variables Entered**	**Variables Removed**	**Method**
1	IBS, B, S, I, BS, IB, IS [a]	.	Enter
a. All requested variables entered.			
b. Dependent Variable: ebit			

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.774[a]	.600	.547	.71828245
a. Predictors: (Constant), IBS, B, S, I, BS, IB, IS				

ANOVA[b]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	40.970	7	5.853	11.344	.000[a]
	Residual	27.344	53	.516		
	Total	68.314	60			
a. Predictors: (Constant), IBS, B, S, I, BS, IB, IS						
b. Dependent Variable: ebit						

Coefficients[a]						
		Unstandardized Coefficients		**Standardized Coefficients**		
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	-24.981	11.847		-2.109	.040
	B	5.666	2.138	5.421	2.651	.011
	S	6.812	2.658	7.483	2.563	.013
	I	4.240	2.214	5.155	1.915	.061
	IB	-.964	.396	-8.731	-2.432	.018
	IS	-1.161	.495	-10.348	-2.346	.023
	BS	-1.555	.474	-12.943	-3.279	.002
	IBS	.267	.088	16.028	3.044	.004
a. Dependent Variable: ebit						

The multiple correlation (R) between profit performance “ebit” and the seven independent variables is significant: .774. The combination of the seven independent variables accounts for 60% of the variation in profit performance (adjusted R square): .547. The regression equation is significant (F 7, 53) = 11.344, p < .001.

Regression Weights: All of the seven independent variables, except **I,** have significant standardised regression weights. Two of the independent variables are significant at the p< .01 ** level: **IBS**, Beta = 16.028, t = 3.044, p < .01; **BS**, Beta = -12.943, t = -3.279, p < .01). The remaining four independent variables are significant at the p < 05 * level: **B**, Beta = 5.421, t = 2.651, p = .011; **S,** Beta = 7.483, t = 2.563, p = .013; **IB,** Beta = -8.731, t = -2.432, p = .018; **IS**, Beta = -10.348, t = -2.346, p = .023. The six independent variables have a significant association with “ebit” (profit performance). The sign of the regression weights B, S, IBS is in the direction with profit performance being positively associated with board control and firm strategy and the interaction of: Information Attributes, Board Control Role, and the firm’s Strategic Configuration. The two-way interaction terms IB, IS and BS are all negatively associated with the criterion variable ‘ebit’.

Consequently, we reject the null hypothesis. The three-way interaction has a significant association with profit performance “ebit”.

Table 6.1C Three-way Interaction with Criterion Variable: Composite Index 'sh'

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	IBS, B, S, I, BS, IB, IS[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: sh

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.263[a]	.069	-.054	1.03896995

a. Predictors: (Constant), IBS, B, S, I, BS, IB, IS

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.257	7	.608	.563	.782[a]
	Residual	57.211	53	1.079		
	Total	61.468	60			

a. Predictors: (Constant), IBS, B, S, I, BS, IB, IS
b. Dependent Variable: sh

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-6.904	17.136		-.403	.689
	B	1.184	3.092	1.195	.383	.703
	S	1.492	3.845	1.728	.388	.699
	I	.373	3.202	.478	.117	.908
	IB	-.055	.573	-.522	-.095	.924
	IS	-.075	.716	-.702	-.104	.917
	BS	-.272	.686	-2.387	-.397	.693
	IBS	.014	.127	.917	.114	.909

a. Dependent Variable: sh

The multiple correlation (R) between shareholder returns “sh” and the seven independent variables is not significant: .263. In addition, the combination of the seven independent variables accounts for less than 7% of the variation in accounting performance (adjusted R square): -.054. The regression equation is not significant (F 7, 53) = .563, p = .782.

Regression Weights: None of the seven independent variables has significant standardised regression weights and none has a significant association with “sh” (shareholder returns). The three-way interaction is not significant and therefore we cannot reject the null hypothesis.

Table 6.1D Three-way Interaction with Criterion Variable: Composite Index 'rg'

Variables Entered/Removed[b]			
Model	**Variables Entered**	**Variables Removed**	**Method**
1	IBS, B, S, I, BS, IB, IS[a]	.	Enter
a. All requested variables entered.			
b. Dependent Variable: rg			

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.495[a]	.245	.146	.80420276
a. Predictors: (Constant), IBS, B, S, I, BS, IB, IS				

ANOVA[b]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	11.141	7	1.592	2.461	.029[a]
	Residual	34.277	53	.647		
	Total	45.418	60			
a. Predictors: (Constant), IBS, B, S, I, BS, IB, IS						
b. Dependent Variable: rg						

Coefficients[a]						
		Unstandardised Coefficients		**Standardised Coefficients**		
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	15.074	13.264		1.136	.261
	B	-2.495	2.393	-2.928	-1.042	.302
	S	-3.918	2.976	-5.278	-1.317	.194
	I	-4.125	2.479	-6.151	-1.664	.102
	IB	.667	.444	7.413	1.504	.139
	IS	1.035	.554	11.319	1.869	.067
	BS	.653	.531	6.665	1.230	.224
	IBS	-.169	.098	-12.484	-1.727	.090
a. Dependent Variable: rg						

The multiple correlation (R) between sales growth “rg” and the seven independent variables is: .495. The combination of the seven independent variables accounts for 24.5% of the variation in sales growth (adjusted R square): .146. The regression equation is significant (F 7, 53) = 2.461, p = .029.

Regression Weights: None of the seven independent variables has significant standardised regression weights and none has a significant association with “rg” sales growth. However, the regression weights of the independent variables **IS**, Beta = 11.319, t = 1.869, p = .067 and **IBS**, Beta = -12.484, t = -1.727, p =.090, though not significant at p<.05, suggest they may play a greater role in any association. The three-way interaction is not significant at p<.05, and therefore we cannot reject the null hypothesis.

6.3 HYPOTHESES 2(a) AND 2(b) SPLIT SAMPLE TWO-WAY INTERACTION

The hypothesised three-way interaction was not significantly associated with any of the three dependent criterion variables: “acc”, “sh”, and “rg”. For these variables, further analysis involved the survey data set being first divided into defender (N = 44) and prospector (N = 53) groups based on the responses. Respondents who indicated a one or two on the Likert scale for either a prospector or defender question were excluded from that specific group. Respondents who indicated a three or more on the Likert scale for either a prospector or defender question were included in that specific group.

Multiple regression analysis was conducted to test the hypothesis of a possible defender/conservative strategy two-way interaction and prospector/entrepreneur strategy two-way interaction statistically as:

Defender Group: Firm Performance = $\alpha 0 + \alpha 1\ (B*I) + \alpha 2\ (B) + \alpha 3\ (I) + r$

Prospector Group: Firm Performance = $\alpha 0 + \alpha 1\ (B*I) + \alpha 2\ (B) + \alpha 3\ (I) + r$

Defender Group

Tables 6.2A, 6.2B, and 6.2C present the results of testing within the defender groups: variables entered, model summary, anova, and coefficients, by each of the three dependent variables in turn. The three independent variables B, I, and BI were entered simultaneously into each analysis. The independent variables are regressed in turn against each of the three dependent variables: “acc”, “sh”, and “rg” that represent the Composite Index of Firm Performance.

None of the two-way interactions are significant for “acc”, “sh”, and “rg” and therefore we cannot reject the null hypothesis in these three instances.

Table 6.2A Two-way Interaction for Defender Groups with Criterion Variable: Composite Index 'acc'

Variables Entered/Removed[b]			
Model	**Variables Entered**	**Variables Removed**	**Method**
1	IB, B, I[a]	.	Enter
a. All requested variables entered.			
b. Dependent Variable: acc			

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.186[a]	.034	-.036	0.74561768
a. Predictors: (Constant), IB, B, I				

ANOVA[b]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	.814	3	.271	.488	.692[a]
	Residual	22.794	41	.556		
	Total	23.608	44			
a. Predictors: (Constant), IB, B, I						
b. Dependent Variable: acc						

Coefficients[a]						
		Unstandardised Coefficients		**Standardised Coefficients**		
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	2.109	2.322		.908	.369
	I	-.278	.458	-.520	-.606	.548
	B	-.373	.442	-.543	-.843	.404
	IB	.053	.086	-.714	-.614	.543
a. Dependent Variable: acc						

Table 6.2B Two-way Interaction for Defender Groups with Criterion Variable: Composite Index 'sh'

Variables Entered/Removed[b]			
Model	**Variables Entered**	**Variables Removed**	**Method**
1	IB, B, I[a]	.	Enter
a. All requested variables entered.			
b. Dependent Variable: sh			

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.217[a]	.047	-.022	1.08056907
a. Predictors: (Constant), IB, B, I				

ANOVA[b]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	2.374	3	.791	.678	.571[a]
	Residual	47.873	41	1.168		
	Total	50.247	44			
a. Predictors: (Constant), IB, B, I						
b. Dependent Variable: sh						

Coefficients[a]						
		Unstandardised Coefficients		**Standardised Coefficients**		
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	.329	3.365		.098	.923
	I	-.005	.664	-.007	-.008	.994
	B	-.214	.641	-.213	-.333	.741
	IB	.033	.124	.311	-.269	.789
a. Dependent Variable: sh						

Table 6.2C Two-way Interaction for Defender Groups with Criterion Variable: Composite Index 'rg'

Variables Entered/Removed[b]			
Model	**Variables Entered**	**Variables Removed**	**Method**
1	IB, B, I[a]	.	Enter
a. All requested variables entered.			
b. Dependent Variable: rg			

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.170[a]	.029	-.042	.96726496
a. Predictors: (Constant), IB, B, I				

ANOVA[b]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	1.141	3	.380	.406	.749[a]
	Residual	38.360	41	.936		
	Total	39.500	44			
a. Predictors: (Constant), IB, B, I						
b. Dependent Variable: rg						

Coefficients[a]						
		Unstandardised Coefficients		**Standardised Coefficients**		
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	-2.394	3.012		-.795	.431
	I	.547	.595	.791	.920	.363
	B	.397	.574	.447	.692	.493
	IB	-.089	.111	-.931	-.798	.430
a. Dependent Variable: rg						

Prospector Group

Tables 6.3A, 6.3B and 6.3C present the results of testing within the prospector groups: variables entered, model summary, anova, and coefficients, by each of the three dependent variables. The three independent variables B, I, and BI were entered simultaneously into each analysis. The independent variables are regressed in turn against each of the three dependent variables: “acc”, “sh”, and “rg” that represent the Composite Index of Firm Performance. None of the two-way interactions is significant for “acc”, “sh”, and “rg” and we therefore cannot reject the null hypotheses.

Table 6.3A Two-way Interaction for Prospector Groups with Criterion Variable: Composite Index 'acc'

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	IB, B, I[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: acc

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.259[a]	.067	.011	1.07678194

a. Predictors: (Constant), IB, B, I

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.160	3	1.387	1.196	.321[a]
	Residual	51.973	50	1.159		
	Total	62.131	53			

a. Predictors: (Constant), IB, B, I
b. Dependent Variable: acc

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.164	5.036		-.430	.669
	I	.567	.947	.543	.599	.552
	B	.522	.940	.554	.555	.581
	IB	-.130	.175	-1.090	-.744	.460

a. Dependent Variable: acc

Table 6.3B Two-way Interaction for Prospector Groups with Criterion Variable: Composite Index 'sh'

Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	IB, B, I[a]	.	Enter

a. All requested variables entered.
b. Dependent Variable: sh

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.105[a]	.011	-.048	1.08681133

a. Predictors: (Constant), IB, B, I

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.653	3	.218	.184	.907[a]
	Residual	59.058	50	1.181		
	Total	59.711	53			

a. Predictors: (Constant), IB, B, I
b. Dependent Variable: sh

Coefficients[a]

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.834	5.083		.558	.580
	I	-.578	.955	-.564	-.605	.548
	B	-.472	.949	-.510	-.497	.621
	IB	.099	.177	.846	.561	.577

a. Dependent Variable: sh

Table 6.3C Two-way Interaction for Prospector Groups with Criterion Variable: Composite Index 'rg'

Variables Entered/Removed[b]			
Model	**Variables Entered**	**Variables Removed**	**Method**
1	IB, B, I[a]	.	Enter
a. All requested variables entered.			
b. Dependent Variable: rg			

Model Summary				
Model	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**
1	.253[a]	.055	-.001	.91613824
a. Predictors: (Constant), IB, B, I				

ANOVA[b]						
Model		**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
1	Regression	2.456	3	.819	.975	.412[a]
	Residual	41.965	50	.839		
	Total	44.421	53			
a. Predictors: (Constant), IB, B, I						
b. Dependent Variable: rg						

Coefficients[a]						
		Unstandardised Coefficients		**Standardised Coefficients**		
Model		**B**	**Std. Error**	**Beta**	**t**	**Sig.**
1	(Constant)	-6.421	4.285		-1.498	.140
	I	1.170	.805	1.323	1.453	.153
	B	1.289	.800	1.617	1.612	.113
	IB	-.233	.149	-2.306	-.1.565	.124
a. Dependent Variable: rg						

6.4 HYPOTHESIS 3

A Pearson correlation matrix was used to test the main effects for an association with each of the four dependent variables: “acc”, “ebit”, “sh”, and “rg” and are expressed in the formulae:

Strategic Configuration: Statistically: $FP = \gamma 0 + \gamma 1\ (S) + r$

Board Control Role type: Statistically: $FP = \gamma 0 + \gamma 1\ (B) + r$

Information Attributes: Statistically: $FP = \gamma 0 + \gamma 1\ (I) + r$

The independent variables: information (I), boards (B), and strategy (S) and the four dependent variables: “acc”, “ebit”, “sh”, and “rg” that represent the Composite Index of Firm Performance were correlated. Table 6.4 presents the results of the main effects correlation.

Consistent with the results in Hypothesis 1, none of the main effects are significant when associated with dependent variables “acc”, “sh”, and “rg” and we therefore cannot reject the null hypothesis. However, the correlation between “ebit” and the independent variable I is significant: Pearson coefficient of correlation = .371 (**. Correlation is significant at the 0.01 level), p = .002. The main effect is significant and has a significant association with profit performance “ebit”. Rejecting the null hypothesis is appropriate.

Table 6.4 Results of the Main Effects Pearson Correlation Matrix

		B	S	I	acc	ebit	sh	rg
B	Pearson Correlation	1	-.074	.164	-.188	-.042	-.019	-.078
	Sig. (2-tailed)		.427	.072	.130	.735	.880	.531
	N	129	118	121	66	66	66	66
S	Pearson Correlation	-.074	1	.257**	-.071	-.113	.018	.196
	Sig. (2-tailed)	.427		.005	.577	.374	.885	.121
	N	118	119	116	64	64	64	64
I	Pearson Correlation	.164	.257**	1	-.140	.371**	.085	-.022
	Sig. (2-tailed)	.072	.005		.263	.002	.496	.864
	N	121	116	128	66	66	66	66
acc	Pearson Correlation	-.188	-.071	-.140	1	.000	.000	.000
	Sig. (2-tailed)	.130	.577	.263		1.000	1.000	1.000
	N	66	64	66	70	70	70	70
ebit	Pearson Correlation	-.042	-.113	.371**	.000	1	.000	.000
	Sig. (2-tailed)	.735	.374	.002	1.000		1.000	1.000
	N	66	64	66	70	70	70	70
sh	Pearson Correlation	-.019	.018	.085	.000	.000	1	.000
	Sig. (2-tailed)	.880	.885	.496	1.000	1.000		1.000
	N	66	64	66	70	70	70	70
rg	Pearson Correlation	-.078	.196	-.022	.000	.000	.000	1
	Sig. (2-tailed)	.531	.121	.864	1.000	1.000	1.000	
	N	66	64	66	70	70	70	70

**. Correlation is significant at the 0.01 level (2-tailed).

6.5 FINDINGS AND DISCUSSION

Table 6.5 summarises the three sets of hypotheses and the results of statistical testing. Hypotheses about the association of Information Attributes, Strategic Configuration, and the Board Control Role Type with Firm Performance test a three-way interaction and subsequent lower order effects. The findings are summarised in Table 6.5.

Table 6.5 Summary of Results of Testing Three Sets of Hypotheses

NO.		HYPOTHESIS		RESULTS OF TESTING
H1		**Three-way interaction**		
		Independent Variables	**Dependent Variables**	
	1.	Strategic Configuration: Board Control Role: Information Attributes	EBIT	Significant interaction
	2.	Strategic Configuration: Board Control Role: Information Attributes	Shareholder Returns	Not significant
	3.	Strategic Configuration: Board Control Role: Information Attributes	Revenue Growth	Regression equation significant/3-way interaction not significant
	4.	Strategic Configuration: Board Control Role: Information Attributes	Accounting Returns	Not significant
H2		**Two-way interaction**		
a.		**Prospector Group**		
		Independent Variables	**Dependent Variables**	
	1.	Board Control Role: Information Attributes	Shareholder Returns	Not significant
	2.	Board Control Role: Information Attributes	Revenue Growth	Not significant
	3.	Board Control Role: Information Attributes	Accounting Returns	Not significant
H2		**Two-way interaction**		
b.		**Defender Group**		
		Independent Variables	**Dependent Variables**	
	1.	Board Control Role: Information Attributes	Shareholder Returns	Not significant
	2.	Board Control Role: Information Attributes	Revenue Growth	Not significant
	3.	Board Control Role: Information Attributes	Accounting Returns	Not significant
H3		**Main Effects**		
a.		**Independent Variables**	**Dependent Variables**	
	1.	Board Control Role	EBIT	Not significant
	2.	Information Attributes	EBIT	Significant effect
	3.	Strategic Configuration	EBIT	Not significant
H3		**Main Effects**		
b.		**Independent Variables**	**Dependent Variables**	
	1.	Board Control Role	Shareholder Returns	Not significant
	2.	Information Attributes	Shareholder Returns	Not significant
	3.	Strategic Configuration	Shareholder Returns	Not significant

H3		**Main Effects**		
c.		**Independent Variables**	**Dependent Variables**	
	1.	Board Control Role	Revenue Growth	Not significant
	2.	Information Attributes	Revenue Growth	Not significant
	3.	Strategic Configuration	Revenue Growth	Not significant
H3		**Main Effects**		
d.		**Independent Variables**	**Dependent Variables**	
	1.	Board Control Role	Accounting Returns	Not significant
	2.	Information Attributes	Accounting Returns	Not significant
	3.	Strategic Configuration	Accounting Returns	Not significant

6.5.1 Findings

Three-Way Interaction

The results of statistically testing a three-way interaction among the Strategic Configuration, Board Control Role and Information Attributes and multiple performance measures is significant when associated with EBIT only. While the literature suggests multiple firm performance measures are used in governance research, this study finds shareholder returns, accounting returns (ROA and ROE), and sales growth are not significantly associated with these governance choices. These findings are discussed below. The regression equation for sales growth is significant; however, the three-way independent variable is not significant and therefore we cannot reject the null hypothesis.

Two-Way Interaction

To test the two-way interaction, the survey responses are divided into defender and prospector groups. Consistent with the findings in the three-way interaction, none of the two-way interactions are significantly associated with any of accounting returns (ROA and ROE), shareholder returns, and revenue growth. In addition, none of the two-way interactions are significant for the prospector group.

Main Effects

Similarly and consistent with the three-way interaction, none of the main effects are significantly associated with accounting returns (ROA and ROE), shareholder returns, and revenue growth. The association between EBIT and Information Attributes is significant.

6.5.2 Implications of Findings

This research finds a significant three-way interaction between the firm's strategic configuration, the board's strategic control role, and information attributes found in SPMS, and firm performance when

measured as EBIT. The implications are as follows:

The board sample was found to overwhelming comprise a ‘boards as management’ control role. This means that boards take active roles in monitoring through both strategic and financial controls. Boards that emphasise strategic control roles shape the context of strategy by setting conditions under which the strategic process happens. In addition, they shape the content and conduct of strategy by evaluating alternatives and continuously monitoring progress, implementation, and results. Boards that emphasise the financial control role, set financial targets and take decisions relative to these targets; they influence control over management on the financial results of the firm. Boards as management do both.

Given the firm’s strategic configuration and the ‘board as management’ control role, the findings of a three-way interaction suggest that boards are more likely to need a ‘balanced scorecard’ of performance information to support both their strategic control roles and financial control roles. Central to the findings in this research is the significant Information Attributes main effect, signalling that ‘information,’ generally, is associated with superior performance. In their strategic control roles, boards will need measures that will have more lead and subjective Information Attributes. To support their financial control role, they also will need lag and objective Information Attributes. The SPMS literature offers generic measures that balance between these Information Attributes (Kaplan & Norton, 1996). This would suggest that a strategic control ‘balanced scorecard’ should contain financial and customer lead indicators. Financial lead indicators include: sales growth; sales in new markets and customers; investment and spending levels in R&D and employ capabilities; and investment in the establishment of new markets. Customer lead indicators include: image and reputation dimensions, product/service attributes, and customer/client relationship dimensions. The financial control ‘balanced scorecard’ would be expected to contain financial and customer lag indicators. Financial lag indicators include: return on capital, operating income, gross margins, cash flow, discounted cash flows. and capital budgeting analysis. Customer lag indicators include: satisfaction, acquisition, and retention measures.

The literature suggests multiple firm performance measures (market and accounting) are used in governance research because of inherit limitations of any single measure (Muth & Donaldson, 1998). The findings in this research suggest, however, that the interaction is associated with higher EBIT, but not higher shareholder returns (market measure) and accounting returns (ROA and ROE). It is argued that EBIT performance captures performances that are largely controllable by the organisation and its executives and board. By contrast, shareholder returns are a function of many things of which EBIT performance is only one. For example, shareholder return is also affected by market sentiment, and in this research, the timeframe happened to coincide with the Global Financial Crisis (GFC), which was a time of notable market volatility and unpredictability. There are well-documented and numerous examples of why shareholder returns are not necessarily related to accounting returns such as EBIT, for example (De Witt & Meyer, 2004; Kothan & Sloan, 1992).

What is more difficult to explain is why only one of the accounting measures of performance yields a significant association and not all of them. It appears that this finding may be also a result of the economic environment prevailing at the time. To explore this further, we examine the change in both EBIT and ROA (EBIT as the numerator of ROA and assets as the denominator of ROA) in this study's 2008 to 2009 data set. A change in EBIT from 2008 to 2009 would be expected to be consistent with a change in ROA from 2008 to 2009 for both EBIT and ROA to yield a significant association with the three-way interaction. An apparently random fluctuation in assets would explain why the 2008 to 2009 EBIT and ROA changes are inconsistent with each other. A Chi-square goodness-of-fit test, where the EBIT change is the expected trend and the ROA the observed trend, reveals a significant departure from the expectation $\chi 2$ (72, N=73) = 104.37, p = 0.007581. Further studies in less volatile times (2008 and 2009 were in the GFC period) may observe a significant association with ROA; this study did not.

In addition to the Chi-squared test, the factor analysis presented in chapter 5 statistically supports the inconsistent findings in association with all accounting measures by examination of the patterns of correlation amongst the dependent variables. None of the other accounting measures loaded with EBIT. In

addition, the 2008 and 2009 EBIT variables loaded independently of all the other performance measures and, when reducing the large number of observed variables, the 2008 and 2009 EBIT variables loaded as one variable.

These findings have implications for both theory and practice as described below.

Theory

This research has made a theoretical contribution to the Organisational Control literature as offered by Eisenhardt (1985) by relating Information Attributes that are found in Strategic Performance Measurement Systems (SPMS) to the Board Control Role typology as proposed by Hendry and Kiel (2004). It has developed and tested a theory that establishes an association among a three-way interaction of: Strategic Configuration, the Board Control Role Type, and Information Attributes, as well as superior Firm Performance when measured as EBIT.

Eisenhardt (1985) suggests that accomplishing organisational control through performance evaluation emphasises the information aspects of control. This research contributes to the understanding of the information attribute aspects and organisational control. It develops the three-way interaction from the literature that provides evidence of lead, behavioural, subjective, and feed-forward (lag, objective, and feedback) attributes of information found in SPMS driver of outcomes (outcomes). These are consistent with the three-way EBIT interaction only, in both the Information Attributes found in the board's strategic control (financial control) role and the Information Attributes found in the performance measurement of Prospector (Defender) strategies. Further, the only main effect that was found to have a significant association with performance (EBIT) is 'Information'.

In addition, the literature acknowledges a role for both driver and driver of outcome measures of strategically linked SPMS (Ittner & Larcker, 2003; Kaplan & Norton, 1996; Wong-On-Wing, Guo, Li, & Yang, 2007). The literature also suggests that there is a Top Management Team (TMT) control system

and a Board of Directors control system parallel (Goold & Quin, 1993; Gupta, 1987; Hitt et al., 1990). As such, this research contributes to the control literature at the board level by observing a three-way interaction with Information Attributes (of which driver and driver outcomes are characteristics), Firm Strategy and Organisational Control, and EBIT Firm Performance.

Practice

The contributions to practice are as follows:

Contribution to Corporate Governance: This research, by finding an interaction between the board's control role, firm strategy, and SPMS with EBIT firm performance, supports Principle 1 and contributes to Principle 2 of the *Corporate Governance Principles and Recommendations (2nd Edition)*. It also contributes to Principles 4 and 8 where board structure is appropriate.

The ASX Corporate Governance Council's *Corporate Governance Principles and Recommendations (2nd Edition: with 2010 Amendments)* is the principles-based framework for governance practice in Australia. Principle 1 in the framework places responsibility on the board in overseeing the company, which includes its control, by providing input into strategy, performance objectives, and the implementation of strategy. An association among the board's role in organisational control; the firm strategy and performance measurement; and firm performance, as found in this study, supports the behaviours recommended in Principle 1 and is consistent with the ASX Governance Council's governance practice.

In addition, this study may assist governance practitioners to expand on the framework of Principle 2. Principle 2 requires the board to effectively structure itself (i.e. composition and independence) to perform its duties. However, studies demonstrate little consistency and yield disparate findings between board structural independence and firm performance. As a result, and given the call to open the black box of actual board behaviour, board practices and processes should accompany structural independence. The framework to achieve this is centred on board theories (i.e. agency, resource dependence, and stewardship)

that create expectations of a board's role. This research adds to Principle 2 by taking this framework approach. The board's strategic and/or financial control roles are underpinned by board theory and, in opening the black box, focuses on board information practices.

All eight ASX Corporate Governance Council's governance principles suggest that boards should play an active control role in their corporations. In this study, 99% of the boards surveyed identified with both strategic and financial control roles, thus strongly emphasising a board as management type. In contribution to governance practice, this would suggest boards are heavily involved in operations and classed as a *de facto* management team.

Contribution to Organisational Control at the Board Level: Organisational control is achieved through performance measurement. Performance measurement parallels, from a strategic and financial control perspective, exist between TMTs and boards. This study contributes to the practice of organisation control by elaborating on the informational aspects of performance measurement at board level.

Contribution to Strategic Performance Measurement Systems (SPMS): Central to performance measurement systems, particularly with the development of strategy maps, is the investigation of cause-and-effect relationships. The Balanced Scorecard is an example of a SPMS where the role of causality is becoming increasingly central to its intellectual underpinning. Lead and lag performance measures feature in cause-and-effect relationships (Kaplan & Norton, 1996). To our knowledge, this is the first use of lead and lag performance measures within a study of information practices at board level. While not the main focus of this study, it would suggest that boards do seek cause-and-effect relationships within their information and control practices and, thus, this research contributes to board SPMS practice.

Contribution to Control Systems and Strategy at the Board Level: Prospector (entrepreneur) and Defender (conservative) strategies are combinations that are consistent with build/differentiation and hold/harvest/cost leadership strategies respectively (Langfield-Smith, 1997). Subjective/behavioural performance measures are associated with the control of Prospector strategies, and objective/financial

performance measures are associated with the control of Defender strategies (Langfield-Smith, 1997). This study contributes to control systems and strategy at the board level, where firm strategies are Prospector and/or Defender types, by observing a three-way interaction with Firm Strategy (adopting the Prospector and Defender typology) Information Attributes and Organisational Control, and Firm Performance.

Contribution to Information Attributes: This study does not consider all information, but takes an Information Attribute perspective in the firm's systems and practices. In this study's context, Information Attributes are seen as qualities or characteristics inherent in information that are common in strategic, control, and performance measurement systems. As information practices are regarded as important in board effectiveness (Lawler et al., 2002), this study contributes to the board's information practice by identifying information attributes (i.e. lead/lag, feedback/feed-forward, objective/subjective, and behavioural/financial) associated with strategic configuration, board control role, and SPMS interaction. In addition, while this study is at board level, the opportunity exists to acknowledge and understand Information Attributes at firm operational level, e.g. Activity Based Management and business re-engineering.

6.6 CHAPTER SUMMARY

This chapter describes the testing of the hypotheses developed in Chapter 3 using the construct variables developed in **Chapter 5. The hypothesised three-way interaction was found to have a significant (p=.000: Adj R Sq .547) association with profit performance "ebit";** however, no significance was observed in association with shareholder returns as the performance measure**. Rejecting the null hypothesis in the association with accounting performance, EBIT, is appropriate.** Also adding to our understanding of the role of information was the finding of a significant Information Attributes "main effect" in this research (Pearson Correlation = .371, p=.002), also associated with EBIT.

The implication for both theory and practice in the findings is discussed. Eisenhardt (1985) suggests that accomplishing organisational control through performance evaluation emphasises the information aspects of control. This research contributes to the understanding of the information attribute aspects and organisational control.

A contribution to practice is discussed and includes a contribution to the The ASX Corporate Governance Council's principles-based framework in respect to board structure, opening the "black box" of board information practices and validating the "board as management" control role. A contribution to organisational control at board level is discussed. In addition, a contribution to the board's information practices by information attributes associating with strategic configuration, board control role, and SPMS interaction is identified.

CHAPTER 7

SUMMARY AND CONCLUSION

7.0 INTRODUCTION

The purpose of this chapter is to summarise the study, restate the objectives of the research and its findings, acknowledge some limitations, and conclude the study. The chapter proceeds as follows: Section 7.1 summarises the objectives and motivation of the study; Section 7.2 summarises the theory development and methodology; and Section 7.3 describes how the hypotheses were tested and presents the findings. Section 7.4 discusses the findings and their contribution to theory and practice. Section 7.5 discusses the limitations of the research and outlines future research directions. Section 7.6 summarises the chapter.

7.1 SUMMARY OF OBJECTIVES AND MOTIVATION

The purpose of this research is to identify those combinations of board role, strategy choice, and Information Attributes which, when incorporated into a board's Strategic Performance Measurement System (SPMS), are associated with superior firm performance.

Research provides evidence that boards which adopt certain key 'best practices' are able to govern more effectively (Lawler et al., 2002). The primary findings are that boards with 'better information' practices are the most effective. The result of adopting better information practices becomes evident when Lawler et al. (2002) test best practice on the impact of Firm Performance. However, the literature as to what the characteristics and nature of the information that boards of directors require in order to help them achieve this is negligible.

In addition, boards and, consequently, their information requirements, are complex by nature as they have dual responsibilities to the corporate organisations they serve and to the shareholders and other

stakeholders. Boards focus on the roles for which they are held accountable and where they have the greatest leverage or influence (Lawler et al., 2002).

Research from an organisational and management control perspective introduces theories, typologies, and contingency frameworks that provide evidence of Information Attributes seminal to board effectiveness (Eisenhardt, 1985; Hendry & Kiel, 2004; Kaplan & Norton, 1996; Langfield-Smith, 1997). This body of literature in turn suggests opportunities to explore the question of what Information Attributes in SPMS, and in what context, are associated with superior firm performance.

Information Attributes are qualities or characteristics inherent in information. Relying on Organisational Control theories (OC) (Eisenhardt, 1985), Management Control Systems (MCS), Strategy typology (Langfield-Smith, 1997), SPMS (Kaplan & Norton, 1996), and the Hendry and Kiel (2004) theoretical perspective, which explains the board's role in strategy, this research tests a theory that the interaction among Information Attributes found in SPMS, the Board's Control Role, and the organisation's Strategic Configuration is associated with superior Firm Performance.

Research Question

Relying on the Hendry and Kiel (2004) theoretical perspective, which explains the board's role in strategy, this research tests a theory that an interaction between Information Attributes found in SPMS, the Board's Control Role, and the organisation's Strategic Configuration will be associated with superior Firm Performance.

Motivation

When common themes that are accepted as best practice corporate governance are associated with corporate financial performance, a substantial body of empirical research yields disparate and conflicting findings (Dalton et al., 2003; Dalton et al., 1998). Motivating this research is an extended framework offered by Huse (2005), using a contingency and integrated theories approach to open the black box of

actual board behaviour. The framework is centred on creating board accountability where pluralistic board theories create board role expectations. In addition, acknowledging the limited power of the Agency Theory Corporate Governance Model, this research identifies with an alternative approach to governance and firm performance, that of Information Asymmetry and Governance (Zahra & Filatotchev, 2004). Lastly, some twenty years ago, Baysinger and Hoskisson (1990) suggested the need to tailor corporate governance to the information processing requirement of different strategies or industry settings.

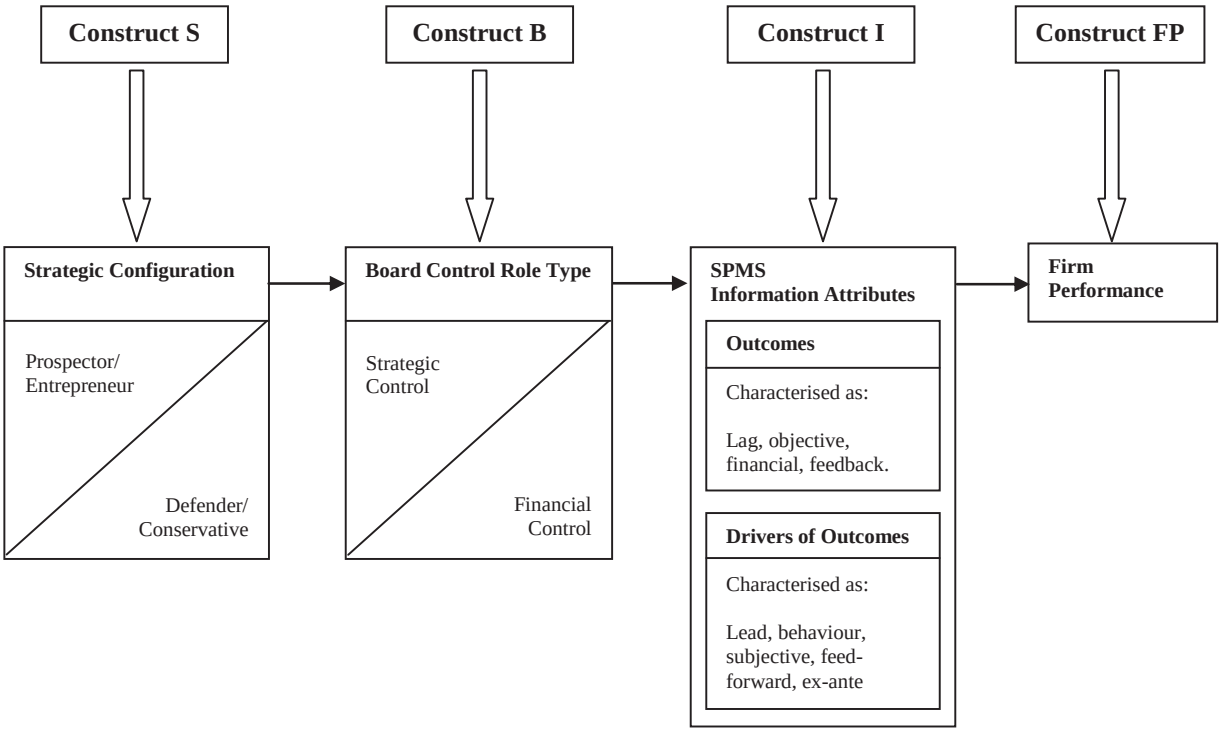
7.2 SUMMARY OF THEORY DEVELOPMENT AND METHODOLOGY

Theory Development

To implement this research, three constructs (the independent variables) are developed (refer to Figure 7.1). Strategic Configuration (Construct S) relies on the Langfield-Smith (1997) Management Control and Strategy theory and aims to capture the extent to which the organisation has adopted a Defender or Prospector strategy. Board Control Role Type (Construct B) is the board typology theory as proposed by Hendry and Kiel (2004), with the possibilities being wholly Financial at one extreme, or wholly Strategic at the other, and various degrees of both in between. Information Attributes (Construct I) are observed in generic SPMS as either outcomes measures or drivers of outcomes measures, as discussed by Kaplan and Norton (1996). Lastly, the Composite Index of Firm Performance (Construct FP) is informed by Muth and Donaldson (1998).

Hypothesis 1 proposed a three-way interaction among Strategic Configuration, Board Control Role Type, and Information Attributes, which when aligned, would be associated with superior Firm Performance. Consistent with recommended statistical process where the three-way interaction hypothesis was not supported, the sample was split into prospector and defender strategy groups, and two-way interactions were tested (Hypothesis 2). Main effects were examined in all cases for association with superior Firm Performance (Hypothesis 3).

Figure 7.1 The Research Diagram



Methodology

Two methods of collecting data were used: archival, which represented less than 20% of the variables required and was used mainly for the dependent variables, and a structured survey, which elicited responses that enabled the building of the independent variables. Each section of the survey had specific questions used to develop and measure the variables in testing the research hypotheses in the research diagram (refer to Figure 7.1).

The survey was administered to companies registered on the ASX in years 2008 and 2009 and addressed to the company chairperson. Response rates are acknowledged as disappointing, but nevertheless provided sufficient data to proceed to develop constructs and test the hypotheses. A Chi-square goodness-of-fit test revealed no significant difference between the percentage of ASX companies and the survey

replies represented in the GICS industry sectors, nor between early and late and mail and web responses. However, the low response rate suggests the research results may, nevertheless, not be representative of the entire population of ASX listed companies.

7.3 HYPOTHESES TESTING AND FINDINGS

Factor analysis was used to reduce the large number of variables to a smaller set of underlying constructs that describe the three independent variables: Strategic Configuration "S", Board Control Role Type "B", and Information Attributes "I", as well as four dependent variables: Accounting returns "acc", EBIT "ebit", Shareholder returns "sh", and Revenue growth "rg".

Hypotheses Testing

Multiple regression analysis was conducted to test the hypotheses and, as no a priori hypotheses have been made to determine the order of entry of the independent variables, the direct method was used.

Findings

The findings of the hypotheses testing are summarised in Table 7.1.

Three-Way Interaction: The results of statistically testing a three-way interaction among the Strategic Configuration, Board Control Role, and Information Attributes and each of the four performance criterion variables yielded a significant association with EBIT only. The regression equation for sales growth was significant, however, the three-way interaction was not significant.

Two-Way Interaction: The sample was then split into Defender and Prospector strategy groups to test the two-way hypotheses using the criterion variables for accounting performance, revenue growth, and shareholder returns. Consistent with the findings for Hypothesis1, none of the two-way interactions were significantly associated with accounting returns (ROA and ROE), shareholder returns, and revenue growth for either group.

Main Effects: A significant main effect was observed between EBIT and Information Attributes. None of the main effects were significantly associated with performance measured as accounting returns (ROA and ROE), shareholder returns, and revenue growth.

7.4 IMPLICATIONS OF THE FINDINGS

This research finds a significant three-way interaction between the firm's strategic configuration; the board's strategic control role; and information attributes found in SPMS; and firm performance when measured as EBIT. The implications are as follows: the board sample was found to overwhelmingly comprise 'boards as management' control role, which means they take active roles in monitoring through both strategic and financial controls. As such, the board shapes the content and conduct of strategy by evaluating alternatives and continuously monitoring progress, implementation, and results. In addition, they set financial targets and take decisions relative to these targets. This suggests that boards are more likely to need a 'balanced scorecard' of performance information to support both their strategic control roles and financial control roles. In their strategic control roles, boards will need measures that will have more lead and subjective Information Attributes. To support their financial control role, they also will need lag and objective Information Attributes.

In addition to the significant three-way interaction as hypothesised, an important finding in this research is the significant Information Attributes main effect, signalling that information of all types (outcomes and drivers of outcomes) is associated with superior performance. The literature suggests that multiple firm performance measures (market and accounting) are used in governance because of inherit limitations of any single measure (Muth & Donaldson, 1998).

The findings in this research are that the interaction is associated with higher EBIT, but not higher shareholder returns (market measure) and accounting returns (ROA and ROE). The firm performance data in the sample reveal a pattern of fluctuation in assets, which is not statistically correlated with observed EBIT, and as a consequence, this explains the statistical finding that there is a significant

association as hypothesised with EBIT, but not with ROA. In addition, there are well-documented and numerous examples of why shareholder returns are not necessarily related to accounting returns, such as EBIT. For example, De Witt and Meyer (2004) find that there are material differences in shareholder returns and accounting returns when assessing a company's investment opportunities, and that maximising accounting returns may not necessarily lead to maximising shareholder returns. In addition, Guy (2000) finds that firm response to TMT remuneration is much stronger in terms of both proportion and statistical significance to shareholder returns, than is the response to accounting returns. This research's timeframe coincided with the Global Financial Crisis (GFC), which was a time of notable market volatility and unpredictability, and it is argued that this may have disrupted the performance data in unknown ways and be a possible reason for not finding some of the hypothesised associations.

These findings have implications for both theory and practice. This research has made a theoretical contribution to the Organisational Control literature as offered by Eisenhardt (1985), by relating Information Attributes that are found in Strategic Performance Measurement Systems (SPMS) to the Board Control Role typology as proposed by Hendry and Kiel (2004). In addition, this research contributes to board theory by opening the black box of actual board behaviour, which is an extended framework offered by Huse (2005). The framework is centred on creating board accountability where pluralistic board theories (i.e. resource dependent, stewardship, and managerial hegemony) create board role expectations.

All eight ASX Corporate Governance Council's governance principles suggest that boards should play an active control role in their corporations. In contributing to practice, 99% of the boards surveyed identified with both strategic and financial control roles, thus strongly emphasising a board as management type, suggesting boards are heavily involved in operations and classed as a *de facto* management team. In addition to corporate governance, this research contributes to practice at board level. Boards should select, given the firms strategic configuration, driver of outcome or lead performance measures and outcome or lag performance measures in organisational control, as they are associated with superior earnings.

Table 7.1 Summary of Results of Testing Three Sets of Hypotheses

NO.		HYPOTHESIS		RESULTS OF TESTING
H1		**Three-way interaction**		
		Independent Variables	**Dependent Variables**	
	1.	Strategic Configuration: Board Control Role: Information Attributes	EBIT	Significant interaction
	2.	Strategic Configuration: Board Control Role: Information Attributes	Shareholder Returns	Not significant
	3.	Strategic Configuration: Board Control Role: Information Attributes	Revenue Growth	Regression equation significant/3-way interaction not significant
	4.	Strategic Configuration: Board Control Role: Information Attributes	Accounting Returns	Not significant
H2		**Two-way interaction**		
a.		**Prospector Group**		
		Independent Variables	**Dependent Variables**	
	1.	Board Control Role: Information Attributes	Shareholder Returns	Not significant
	2.	Board Control Role: Information Attributes	Revenue Growth	Not significant
	3.	Board Control Role: Information Attributes	Accounting Returns	Not significant
H2		**Two-way interaction**		
b.		**Defender Group**		
		Independent Variables	**Dependent Variables**	
	1.	Board Control Role: Information Attributes	Shareholder Returns	Not significant
	2.	Board Control Role: Information Attributes	Revenue Growth	Not significant
	3.	Board Control Role: Information Attributes	Accounting Returns	Not significant
H3		**Main Effects**		
a.		**Independent Variables**	**Dependent Variables**	
	1.	Board Control Role	EBIT	Not significant
	2.	Information Attributes	EBIT	Significant effect
	3.	Strategic Configuration	EBIT	Not significant
H3		**Main Effects**		
b.		**Independent Variables**	**Dependent Variables**	
	1.	Board Control Role	Shareholder Returns	Not significant
	2.	Information Attributes	Shareholder Returns	Not significant
	3.	Strategic Configuration	Shareholder Returns	Not significant

H3		**Main Effects**		
c.		**Independent Variables**	**Dependent Variables**	
	1.	Board Control Role	Revenue Growth	Not significant
	2.	Information Attributes	Revenue Growth	Not significant
	3.	Strategic Configuration	Revenue Growth	Not significant
H3		**Main Effects**		
d.		**Independent Variables**	**Dependent Variables**	
	1.	Board Control Role	Accounting Returns	Not significant
	2.	Information Attributes	Accounting Returns	Not significant
	3.	Strategic Configuration	Accounting Returns	Not significant

7.5 LIMITATIONS AND FURTHER RESEARCH

7.5.1 Limitations of Research

While it is necessary to acknowledge that survey methods expose studies to internal validity threats, this research is concerned with eliciting facts and beliefs from the board's experiences in the context examined. Survey methods offer this strength when, as is the case in this research, external validity is at a premium. Four potential threats to validity, as identified by Cook and Campbell (1979), are discussed in the following sections.

Threats to Internal Validity

Internal validity relates to events that prevent reasonable conclusions about causality being drawn. Concerns about internal validity are mostly raised in the context of experimental design, where strict randomisation procedures need to be implemented to control effects such as maturation, history, mortality, instrumentation changes, and statistical regression.

A survey method, such as employed in this research, is not subject to the concerns listed above. However, the usual caution that correlation does not imply causation must be kept in mind when considering the implications of findings in this research.

Threats to Statistical Conclusion Validity

Data obtained through survey methods are always subject to measurement and other errors that cannot be controlled. If error is random, its presence will not threaten statistical conclusions; however, the presence of unknown systematic error within data obtained by survey methods cannot be fully discounted. Researchers accept this risk when they nominate an experimental risk level (alpha). Given the number of individual tests planned as part of this research (28 tests for the three sets of hypotheses), concerns about inflated type 1 error (rejecting the null hypothesis when it is true) are acknowledged.

Data obtained through survey methods are always subject to measurement and other errors which cannot be controlled. If error is random its presence will not threaten statistical conclusions, however the presence of unknown systematic error within data obtained by survey methods cannot be fully discounted. Researchers accept this risk when they nominate an experimental risk level (alpha) that they are prepared to accept. Given the number of individual tests planned as part of this research (28 tests for the three sets of hypotheses), concerns about inflated type 1 error (rejecting the null hypothesis when it is true) are addressed.

A strategy for minimising type 1 error is to reduce the acceptable level of experimental error. A modified Bonferroni adjustment to planned experimental error of 0.05 would reduce alpha to 0.0036. At this level, none of the conclusions using the original experimental error of 0.05 would be altered.

Threats to Construct Validity

Construct validity refers to the degree to which inferences can legitimately be made from the representations in a study, to the theoretical constructs on which those representations were based. A strength of this study is that all theories, typologies, and frameworks used are validated by other researchers in acceptable journals. These are Kaplan and Norton (1996) for the Information Attribute construct, Hendry and Kiel (2004) for the Board Control Role Type construct, and Langfield-Smith (1997) for the Strategic Configuration construct. These representations were tested again in this research context and reconfirmed within the data set.

Threats to External Validity

The objective of this research was to develop and test a theory that an interaction among Information Attributes found in Strategic Performance Measurement Systems (SPMS), the Board's Control Role, and the organisation's Strategic Configuration is associated with superior Firm Performance. While the response rate of 7.2% is acknowledged as being low, research suggests that 137 replies are acceptable for

analysis of the type carried out in this research (Stiles, 2001). In addition, external validity is at a premium by avoiding anonymity and eliciting a rich response from the board chairperson. However, even though a Chi-square goodness-of-fit test revealed no significant difference between the percentage of ASX companies and the survey replies represented in the GICS industry sectors, the low response rate would suggest the research results may not be representative of the entire population of ASX listed companies. Care would therefore be needed in extrapolating the findings into broader business contexts.

7.5.2 Future Research

This section suggests four future research directions to follow from this research. In this study's context, Information Attributes are seen as the characteristics and nature of information such as lead/lag; objective/subjective financial/non-financial and feed-forward/feedback found in driver of outcomes; and outcome measure of SPMS. To our knowledge, this is the first research to adopt an Information Attribute methodology approach to information. The first suggestion, given the significance in this research, is for future research in SPMS to embrace an Information Attribute approach to information in the same context as this research where appropriate. For example, Ittner and Larker (2003) find companies are unable to demonstrate that improvements in nonfinancial measures actually affect their financial results. They suggest developing a model that proposes a causal relationship between the chosen non-financial drivers of strategic success (lead) and specific outcomes (lag).

Secondly, the aim is to extend the research from boards of directors to Top Management Teams (TMT), allowing the opportunity to test this study's theory from different management perspectives.

In addition, while this study investigated only two of the four Kaplan & Norton (1996) balanced scorecard perspectives (financial and customer), future research could investigate SPMS use of the other two balanced scorecard perspectives, the internal business process, and learning and growth perspectives to add to our understanding of how boards use different performance measurement approaches and different information attributes. However, given the uniqueness in these perspectives, a case study

approach, rather than a survey, may be the better methodology.

Lastly, this research identifies with the call by Roberts, McNulty et al. (2005) to dismantle the boards and corporate performance fortresses, which are variously referred to as: contentious publish or perish research drive (Huse, 2000), the focus on the 'usual suspects' (Finkelstein & Mooney, 2003), with easily available data (lamp syndrome), and accepted and easy-to-use methods (hammer syndrome) (Gabrielsson & Huse, 2004). In addition, it responds to Huse's (2005) call to use a contingency and integrated theories approach to open the black box of actual board behaviour (Daily et al., 2003; Huse, 2005). While this research focused on the board's strategic process in SPMS, further research should consider applying this research methodology (i.e. an Information Attribute approach) to specific organisational strategies—for example, sustainability, environmental, and risk strategies.

7.6 CHAPTER SUMMARY

This chapter concludes the thesis. It presents a summary of the objectives, motivation, theory development, and methodology for the study. In addition, it summarised the findings of the research and then identified with its limitations and presented suggestions for further research.

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APPENDIX 3A

QUESTIONS ON PERCEIVED ENVIRONMENTAL UNCERTAINTY

Environmental Uncertainty (EU)

QUESTIONS ON PERCEIVED ENVIRONMENTAL UNCERTAINTY

1. How intense is each of the following in your industry?

	Of negligible intensity						Extremely intense
a. Bidding for purchases or raw materials:	1	2	3	4	5	6	7
b. Competition for manpower:	1	2	3	4	5	6	7
c. Price competition:	1	2	3	4	5	6	7

2. How many new products and/or services have been marketed during the past 5 yrs by your industry?

None						Many
1	2	3	4	5	6	7

3. How stable/dynamic is the external environment (economic and technological) facing your firms?

	Very stable (Changing slowly)				Very dynamic (Changing rapidly)		
a. Economic:	1	2	3	4	5	6	7
b. Technological:	1	2	3	4	5	6	7

4. How would you classify the market activities of your *competitors* during the past 5 yrs?

Becoming more predictable.						Becoming less predictable
1	2	3	4	5	6	7

5. During the past 5 yrs, the tastes and preferences of your *customers* have become:

Much easier to predict.						Much harder to predict
1	2	3	4	5	6	7

6. During the past 5 yrs, the legal, political, and economic constraints surrounding your firm have:

Remained about the same.						Have proliferated greatly
1	2	3	4	5	6	7

7. How often do new scientific discoveries emerge in your industry?

Seldom						Frequently
1	2	3	4	5	6	7

APPENDIX 3B

QUESTIONS ON INFORMATION ASYMMETRY

Information Asymmetry (IA)

Quality of Information

In general, the information available to the board is very reliable (Reliability).
1 2 3 4 5 6 7

The information available to the board is accessible when needed, not at some later time (Timeliness).
1 2 3 4 5 6 7

It is necessary to go back and check on the accuracy of the information the board receives (Accuracy) (R).
1 2 3 4 5 6 7

The available information is relevant to the board's needs (Relevance).
1 2 3 4 5 6 7

The board receives information in a timely fashion.
1 2 3 4 5 6 7

The information available is very useful in assessing organisational issues.
1 2 3 4 5 6 7

The available information is just what the board needs to make effective decisions.
1 2 3 4 5 6 7

Proactiveness

The board spends a great deal of time searching for information about issues facing the board.
1 2 3 4 5 6 7

Board members actively search for information in order to address issues before the board.
1 2 3 4 5 6 7

Board members make decisions based on the information provided to them without requesting additional information (R).
1 2 3 4 5 6 7

At a typical board meeting, the board actively probes for information necessary to carry out their duties.
1 2 3 4 5 6 7

APPENDIX 4A

THE SURVEY

ASX Code…….. Company Name……..……..

GICS Sector…….. Role/Position of person completing this questionnaire……

Section A

Please indicate to what extent your Board draws on the following **financial** information:	**Not at All**				**Somewhat**		**Significantly**
1. Sales growth.	1	2	3	4	5	6	7
2. Sales in new markets and to new customers and/or Sales from new products and services.	1	2	3	4	5	6	7
3. Investment and spending levels in for e.g. product and process development (R&D), systems and employee capabilities.	1	2	3	4	5	6	7
4. Investment in the establishment of new marketing, sales and distribution channels.	1	2	3	4	5	6	7
5. Traditional Measures such as Return on Capital Employed, operating income, gross margins etc.	1	2	3	4	5	6	7
6. Traditional measures for investment projects e.g. Discounted Cash flow and Capital Budgeting Analysis.	1	2	3	4	5	6	7
7. Cash Flow.	1	2	3	4	5	6	7
8. Asset utilisation for e.g. working capital ratios, paybacks and throughput.	1	2	3	4	5	6	7

Section B

Please indicate to what extent your Board draws on the following **customer/client** information:	**Not at All**				**Somewhat**		**Significantly**
9. Customer/client satisfaction measures.	1	2	3	4	5	6	7
10. Image and reputation dimensions, which enables the company to pro-actively define itself for its customers, e.g. brand equity.	1	2	3	4	5	6	7
11. Customer/client acquisition measures.	1	2	3	4	5	6	7
12. Product/service attributes (encompass the functionality of the product /service, its price, its uniqueness, and its quality).	1	2	3	4	5	6	7
13. Customer/client retention measures.	1	2	3	4	5	6	7
14. Customer/client relationship dimension (includes product/service delivery, e.g. convenience, trust, and response).	1	2	3	4	5	6	7

Section C

How intense is each of the following in your industry?	**Of negligible intensity**				**Extremely intense**		
15. Bidding for purchases or raw materials.	1	2	3	4	5	6	7
16. Competition for manpower.	1	2	3	4	5	6	7
17. Price competition.	1	2	3	4	5	6	7

18. How many new products and/or services have been marketed during the past 5 years by your industry?	**None** 1	2	3	4	**Many** 5	6	7

How stable/dynamic is the external environment (economic and technological) facing your firm?	**Very stable (Changing slowly)**				**Very dynamic (Changing rapidly)**		
19. Economic.	1	2	3	4	5	6	7
20. Technological.	1	2	3	4	5	6	7

21. How would you classify the market activities of your *competitors* during the past 5 years?	**More predictable.** 1	2	3	4	**Less predictable** 5	6	7

22. During the past 5 years, the tastes and preferences of your *customers* have become.	**Much easier to predict.** 1	2	3	4	**Much harder to predict** 5	6	7

23. During the past 5 years, the legal, political, and economic constraints surrounding your firm have:	**Remained about the same.** 1	2	3	4	**Proliferated greatly** 5	6	7

24. How often do new technological advances emerge in your industry?	**Seldom** 1	2	3	4	**Frequently** 5	6	7

Section D

Please indicate to what extent you agree with the following statements:	**Strongly disagree**						**Strongly agree**
25. The board shapes the **context** of strategy by setting the conditions under which the strategy process happens in the organisation.	1	2	3	4	5	6	7
26. The board shapes the **content** of strategy by requiring that management justify their intentions, by evaluating alternatives, and by continuously monitoring progress during formulation and assessment stage.	1	2	3	4	5	6	7
27. The board shapes the **conduct** of strategy by continuously monitoring implementation and results and by making changes where appropriate.	1	2	3	4	5	6	7
28. The board sets financial targets only and takes strategic decisions relative to these financial targets by approving, rejecting, or referring strategic proposals back to management.	1	2	3	4	5	6	7
29. The board exerts influence over management at formal board meetings after resources have been committed and spending approved.	1	2	3	4	5	6	7
30. The board evaluates management on the financial results of the firm.	1	2	3	4	5	6	7

Section E

	Strongly disagree						**Strongly agree**
31. In general, the information available to the board is very reliable.	1	2	3	4	5	6	7
32. In general, the available information is relevant to the board's needs.	1	2	3	4	5	6	7
33. In general, the board receives information in a timely fashion.	1	2	3	4	5	6	7
34. At a typical board meeting, the board actively probes for information necessary to carry out their duties.	1	2	3	4	5	6	7

Section F

Please indicate to what extent you agree with the following statements:	**Strongly disagree**						**Strongly agree**
35. Our firm's strategy does not aggressively pursue markets, but finds and maintains a relatively stable and secure market.	1	2	3	4	5	6	7
36. Our firm's strategy is to expand into new markets, stimulate new opportunities, and obtain additional market share.	1	2	3	4	5	6	7

To what extent are the following functions critical to your organisation's success:	**Not at All**						**Significantly**
37. Operations (e.g. production and engineering efficiency).	1	2	3	4	5	6	7
38. Finance.	1	2	3	4	5	6	7
39. Marketing.	1	2	3	4	5	6	7
40. Research and development.	1	2	3	4	5	6	7

	Not at All						**Significantly**
41. To what extent can the information your Board receives be described as "outcomes", which is characterised as objective, financial, feedback, and after the event-type information.	1	2	3	4	5	6	7
42. To what extent can the information your Board receives be described as "drivers of outcomes", which is characterised as subjective, behavioural, feed-forward, and before the event-type information.	1	2	3	4	5	6	7

	Not at All						**Significantly**
43. To what degree does your board focus on performance and achievements?	1	2	3	4	5	6	7
44. To what degree does your board focus on compliance requirements?	1	2	3	4	5	6	7

End – thank you for taking the time to support this research

APPENDIX 4B

COMMENTS AND SUGGESTIONS FROM PRACTISING DIRECTORS AND ACADEMIC PROFESSORS

Director 1

- *It took me about 15 minutes to complete the survey.*
- *Is there going to also be a covering statement as to confidentiality and what will be done with the completed surveys and research. As a director, I'd be very hesitant to honestly complete the survey and then have the results released as attributed to my company. Given the surveys are going to ASX listed companies, the sensitivity to the market is also important.*
- *It might be just because I completed this from the perspective of (a service business) … but I found that some of the questions weren't applicable – maybe also have a NA option?*
- *It is probably a deliberate part of the survey design, but I found it more confusing with the different response headings – and a mix of statements and questions.*
- *I have highlighted any minor typos or grammatical errors in yellow.*
- *I found section F very difficult to read and answer. In particular, Q 36 has two statements but you can only respond to one.*
- *Also, in section F, the scale seems to have been switched around. In section E the 6 and 7 responses are the strongly agree responses, but in section F, they are the opposite.*
- *I found the statements in questions 37 and 38 very confusing. In fact, I couldn't respond to these statements as I wasn't sure what they meant.*
- *I'd be interested in the results at the end of the day.*

Director 2

- *Firstly, the wording and the content structure is not relevant or appropriate to the (not-for-profit) ... sector. And I take it the survey is not aimed at that sector.*

- *Secondly, it seems to me to be somewhat focused on enquiring around specific parameters and is limited in the information it is drawing out. To me, this is a good survey <u>if that is the intent</u>.*

- *Thirdly, it appears to me to be somewhat limited in its applicability across all industries. That is, it seems limited to certain types of industries. Is this correct, or is it my mis-reading?*

- *Fourthly, the timing is around the 10-minute mark as intended.*

- *Fifth: Section B, to be answered accurately <u>could</u> require some research and enquiry for the participant to clarify detail. It would depend on what degree of accuracy the participant feels necessary to adhere to.*

- *Sixth: I pondered the questions that begin with: 'during the past five years.....' With the significant upheavals we have experienced over the past five years (financial crunch), the answers could be skewed to reflect a more limited time frame. That is, only the past eighteen months or so.*

- *Seventh: The questions in Section D are very specific and therefore limit the response to the design of the question. That is, they have significant detail in the question to focus the question to only that situation. I am not sure if this is the intent and wonder if there is a case for a more open-ended question regarding organisational control.*

Director 3

- *The layout of the survey was a bit cramped and a definite lack of font size and whitespace. I don't know whether this was caused by the eternal PC v. Mac translation issues or whether it could be improved - also I wonder whether an electronic and online version would facilitate a better response from ASX listed entities. This could also have a "more information" box for explaining things in more detail so it isn't purely a quantitative exercise.*

- *In Section A - I have taken "Sales" as representing "Revenue" in … case.*

- *In Section B - it was a bit sobering to reflect on the fact that we probably don't know enough about our customers due to the way in which … is structured. But I am confident this trend can be reversed via the new services that we are introducing at present.*

- *In Question 15, I have referred to the …. tender process as this is the major tender that is associated with … operations at present.*

- *I was able to complete the survey in approximately 20 minutes.*

Academic professors

Useful input by the three academic professors included: multipoint questions, clarity in meaning, inconsistent formatting, G F C impact, punctuation, and layout. One very useful piece of advice was to source data by questioning both directly and indirectly.

APPENDIX 4C

COVERING LETTER

Mr
Executive Chairman
Company Limited
Address

Telephone: (07) 5595 2099
Facsimile: (07) 5595 1160
E-mail: cgunther@bond.edu.au

Date February 2010

Dear Mr

The pursuit by Boards of better information to support their corporate goals and facilitate accountability has generated a significant body of research at both academic and practitioner levels. Unfortunately it has yet to generate a sound basis for Boards to build their information and reporting packages with any certainty that they are 'getting it right'. In an attempt to rectify this shortfall we are undertaking research that aims to provide answers to some of the questions that Boards rightly ask about their reporting requirements. Our research is Australian based, and is being gathered from all companies listed on the ASX.

To assist us with our research, we would be most grateful if you would complete the enclosed questionnaire and return it to us in the prepaid envelope that is enclosed. It has 6 sections (A-F), 44 questions, is 4 pages long and will take approximately ten minutes to complete. We do request you to write the name of your company and GICS sector and verify the ASX code on the questionnaire so that we can combine your responses with publicly available information about the company. In doing this, we acknowledge the confidential nature of some of your responses, and give you our absolute assurance that your responses will be known only to the two researchers named below, and will be treated confidentially. All data will be aggregated in our analysis and no individual company will be identifiable in any report or paper that we write.

Should you wish to receive a summary of our findings please indicate this, and when they are available it will be our pleasure to share them with you at that time.

Thank you for your assistance in this matter.

Yours faithfully,

Dr Lyndal Drennan and Mr Chris Gunther.

Should you have any complaint concerning the manner in which this research is conducted, please do not hesitate to contact Bond University Research Ethics Committee, quoting the Project Number RO427

The Complaints Officer

Bond University Human Research Ethics Committee

Bond University Research Institute

Level 2, Room 232, Conference Centre

Bond University Gold Coast, 4229.

Telephone (07) 5595 4194 Fax (07) 5595 5009

APPENDIX 4D

SUPPORTING WEB OPTION COVERING LETTER

1 Mr
2 Executive Chairman
3 Co Name

Telephone: (07) 5595 2099
Facsimile: (07) 5595 1160
E-mail: cgunther@bond.edu.au

4 Dear Mr

With regards to our survey we mailed to you recently we do have a friendly "web based" survey option for your convenience.

You will recall our research as the following:
The pursuit by Boards of better information to support their corporate goals and facilitate accountability has generated a significant body of research at both academic and practitioner levels. Unfortunately it has yet to generate a sound basis for Boards to build their information and reporting packages with any certainty that they are 'getting it right'. In an attempt to rectify this shortfall we are undertaking research that aims to provide answers to some of the questions that Boards rightly ask about their reporting requirements. Our research is Australian based, and is being gathered from all companies listed on the ASX.

To assist us with our research we would be most grateful if you would complete the survey at the "START" prompt below. The survey has 6 sections (A-F), 44 questions and will take approximately ten minutes to complete. We do request you to type the name of your company and verify the ASX code on the survey so that we can combine your responses with publicly available information about the company. In doing this, we acknowledge the confidential nature of some of your responses, and give you our absolute assurance that your responses will be known only to the two researchers named below, and will be treated confidentially. All data will be aggregated in our analysis and no individual company will be identifiable in any report or paper that we write.

Should you wish to receive a summary of our findings please indicate this, and when they are available it will be our pleasure to share them with you at that time.

Thank you for your assistance in this matter.

Yours faithfully,

Dr Lyndal Drennan and Mr Chris Gunther.

APPENDIX 4E

SUMMARY OF EARLY AND LATE MAIL AND WEB RESPONSES

Mail 1												
ASX Code	**Source**	**Co-opt**	**Size**	**Cat No**	**Composition**	**Size**	**Cat No**	**Committees**	**Cat No**	**MarkCap**	**Size**	**Cat No**
AEJ	Mail1	0.75	High		0.75	High		3		4,065,103	Small	
AGO	Mail1	0.20	Low		0.80	High		3		2,951,803,588	Large	
AJL	Mail1	0.20	Low		0.60	Medium		1		89,258,846	Small	
ALU	Mail1	0.00	None		0.50	Medium		3		10,246,200	Small	
ALY	Mail1	0.25	Low		0.25	Low		1		19,002,244	Small	
ANG	Mail1	0.40	High		0.80	High		1		365,743,455	Medium	
ANP	Mail1	0.60	High		0.50	Medium		2		8,885,372	Small	
AWE	Mail1	0.33	Low		0.83	High		2		756,714,314	Medium	
AXI	Mail1	0.00	None		0.40	Low		1		15,163,422	Small	
BOL	Mail1	0.50	High		0.67	High		3		143,065,220	Medium	
BOQ	Mail1	0.00	None		0.80	High		3		1,890,850,499	Large	9
CCU	Mail1	0.33	Low		0.67	High		0		141,127,357	Medium	
CGO	Mail1	0.25	Low		0.25	Low		3		23,772,354	Small	
CIR	Mail1	0.29	Low		0.71	High		2		27,838,156	Small	
CNB	Mail1	0.00	None		0.50	Medium		2		65,123,189	Small	
CSE	Mail1	0.00	None		0.67	High		0		12,945,557	Small	
CST	Mail1	0.20	Low		0.40	Low		2		324,031,491	Medium	
CUU	Mail1	0.00	None		0.80	High		3		4,553,077	Small	
CVC	Mail1	0.50	High		0.50	Medium		1		112,553,716	Medium	14
CYS	Mail1	0.33	Low		0.33	Low		0		6,958,849	Small	
DWS	Mail1	0.00	None		0.60	Medium		3		176,042,474	Medium	
EAL	Mail1	0.00	None		0.60	Medium		3		15,938,867	Small	
ELD	Mail1	0.63	High		0.88	High		3		199,626,323	Medium	
ENB	Mail1	0.00	None		0.75	High		3		5,183,043	Small	
ESS	Mail1	0.00	None		0.25	Low		2		31,243,340	Small	

FLT	Mail1	0.00	None		0.50	Medium		2		2,077,879,294	Large	
FPS	Mail1	0.25	Low		0.75	High		2		45,428,077	Small	
FUT	Mail1	0.67	High		0.67	High	27	0	7	4,922,835	Small	
FWL	Mail1	0.40	High	17	0.40	Low		2		15,963,971	Small	
GDY	Mail1	0.38	Low		0.75	High		3		65,694,102	Small	
MCR	Mail1	0.50	High		0.75	High		3		198,602,715	Medium	
MDL	Mail1	0.00	None		0.50	Medium		2		378,588,265	Medium	
MGK	Mail1	0.00	None		0.25	Low		3		10,286,708	Small	
MGZ	Mail1	0.00	None		0.20	Low		3	25	2,730,224	Small	35
MHC	Mail1	0.25	Low		0.50	Medium		0		37,897,027	Small	
MIN	Mail1	0.00	None		0.60	Medium		3		2,028,024,773	Large	
MLB	Mail1	0.57	High		0.86	High		3		140,352,960	Medium	
MNC	Mail1	0.14	Low	15	0.86	High		2		511,954,893	Medium	
MSH/RRP	Mail1	0.00	None		0.25	Low		2		14,898,989	Small	
MVP	Mail1	0.71	High		0.71	High		3		25,678,825	Small	
NME	Mail1	0.00	None		0.50	Medium		0		15,705,111	Small	
ORM	Mail1	0.50	High		0.50	Medium		1		18,307,411	Small	
PDM	Mail1	0.33	Low		0.33	Low		1	8	3,424,274	Small	
PDN	Mail1	0.00	None		0.80	High		3		2,356,425,597	Large	
PEX	Mail1	0.00	None		0.50	Medium	18	0		8,687,974	Small	
PNN	Mail1	0.00	None		0.50	Medium		2		12,109,837	Small	
QAN	Mail1	0.80	High		0.80	High		3		4,598,200,948	Large	
SHL	Mail1	0.00	None		0.56	Medium		3		4,692,232,890	Large	
SPT	Mail1	0.43	High		0.71	High		2		606,991,134	Medium	
SRH	Mail1	0.00	None		0.50	Medium		2	18	6,500,000	Small	
STP	Mail1	0.00	None		0.40	Low		2		34,789,982	Small	
SYR	Mail1	0.00	None	26	0.00	Low	13	1		3,570,750	Small	
TBI	Mail1	0.00	None		0.67	High		3		6,903,111	Small	

TGR	Mail1	0.67	High		0.83	High		3		208,483,775	Medium	
TSE	Mail1	0.56	High		0.78	High		2		1,935,000,168	Large	
URM	Mail1	0.00	None		0.75	High		2		10,244,677	Small	
VGH	Mail1	0.57	High		0.57	Medium		3		8,903,703	Small	
WPL	Mail1	0.22	Low		0.89	High		3		36,250,602,774	Large	
Totals				**58**			**58**		**58**			**58**

Mail 2												
ASX Code	**Source**	**Co-opt**	**Size**	**Cat No**	**Composition**	**Size**	**Cat No**	**Committees**	**Cat No**	**MarkCap**	**Size**	**Cat No**
AAD	Mail2	0.60	High		0.80	High		3		437,453,469	Medium	
AEO	Mail2	0.55	High		0.55	Medium		2		703,358,764	Medium	
AGF	Mail2	0.40	High	12	0.60	Medium		3		252,249,061	Medium	
AGS	Mail2	0.50	High		0.50	Medium	10	1		86,998,938	Small	
AVE	Mail2	0.50	High		0.83	High		3		314,991,249	Medium	
AXA	Mail2	0.33	Low		0.78	High		3		13,270,753,398	Large	
BKL	Mail2	0.71	High		0.71	High		3		475,537,892	Medium	
BXB	Mail2	0.78	High		0.78	High		3		10,725,341,541	Large	
CDA	Mail2	0.00	None		0.63	High	22	2		208,465,394	Medium	
CLQ	Mail2	0.00	None		0.67	High		3	15	3,030,692	Small	17
CLU	Mail2	0.25	Low		0.50	Medium		2	13	5,344,998	Small	
CXY	Mail2	0.33	Low		0.67	High		1		27,166,365	Small	
DLE	Mail2	0.00	None		0.60	Medium		3		27,867,560	Small	
FXJ	Mail2	0.56	High		0.89	High		3		2,398,994,839	Large	
GGH	Mail2	0.43	High		0.75	High		3		24,020,560	Small	
GNC	Mail2	0.86	High		0.86	High		3		1,642,080,492	Large	6
HLX	Mail2	0.00	None	11	0.50	Medium		2		14,412,785	Small	
HSN	Mail2	0.20	Low		0.60	Medium		2		142,139,418	Medium	
HTC	Mail2	0.38	Low		0.78	High		2		10,647,396	Small	
JBH	Mail2	0.00	None		0.67	High		2		1,652,360,895	Large	
JYC	Mail2	0.20	Low		0.40	Low		2		11,176,892	Small	
MFG	Mail2	0.00	None		0.60	Medium		1		225,820,671	Medium	
MTN	Mail2	0.75	High		0.75	High		1	6	17,980,518	Small	
OEL	Mail2	0.57	High		0.57	Medium		1		108,915,846	Medium	12
PAN	Mail2	0.00	None		0.80	High		2		378,902,799	Medium	

PRO	Mail2	0.33	Low		0.33	Low		2		10,386,152	Small	
QBE	Mail2	0.00	None		0.78	High		3		19,012,189,813	Large	
RHL	Mail2	0.17	Low	12	0.67	High		3		183,214,215	Medium	
RKN	Mail2	0.25	Low		0.25	Low	3	2		322,789,425	Medium	
SNO	Mail2	0.00	None		0.67	High		2		80,899,813	Small	
SSL	Mail2	0.25	Low		0.75	High		0	1	32,029,916	Small	
SUM	Mail2	0.00	None		0.75	High		2		36,405,123	Small	
TCQ	Mail2	0.17	Low		0.83	High		3		38,647,126	Small	
TOE	Mail2	0.17	Low		0.83	High		1		80,089,744	Small	
WFL	Mail2	0.00	None		0.50	Medium		3		45,720,995	Small	
Totals				**35**			**35**		**35**			**35**

Web 1												
ASX Code	**Source**	**Co-opt**	**Size**	**Cat No**	**Composition**	**Size**	**Cat No**	**Committees**	**Cat No**	**MarkCap**	**Size**	**Cat No**
AAO	Web1	0.00	None		0.33	Low		0		32,197,456	Small	
AIR	Web1	0.00	None		0.80	High		0		21,548,104	Small	
AVX	Web1	0.00	None		0.75	High		3		47,470,571	Small	
AXZ	Web1	0.00	None		0.60	Medium		0		44,590,000	Small	
BKM	Web1	0.67	High		0.67	High		0	5	3,203,288	Small	14
COY	Web1	0.00	None		0.67	High		1		14,607,143	Small	
CPU	Web1	0.25	Low		0.63	High	10	3		5,139,892,545	Large	1
CRG	Web1	0.33	Low		0.67	High		3		821,168,723	Medium	
CSS	Web1	0.29	Low		0.43	Low		2		52,891,235	Small	
GLM	Web1	0.00	None		0.33	Low		1	3	3,430,664	Small	
III	Web1	0.33	Low		0.67	High		3		12,507,914	Small	
MDX	Web1	0.00	None		0.60	Medium		2		45,454,370	Small	
MLX	Web1	0.00	None		0.33	Low		2		327,758,827	Medium	
MSF	Web1	0.25	Low		0.50	Medium	4	0		278,044,819	Medium	
OIL	Web1	0.00	None	9	0.00	Low	6	3	8	6,504,289	Small	
PPI	Web1	0.17	Low	8	0.50	Medium		1		39,833,880	Small	
STG	Web1	0.75	High		0.75	High		3		7,831,772	Small	
TCN	Web1	0.25	Low		0.25	Low		2	4	8,049,335	Small	
UXC	Web1	0.20	Low		0.80	High		3		174,300,139	Medium	
WDS	Web1	0.50	High	3	0.67	High		3		108,041,746	Medium	5
Total				**20**			**20**		**20**			**20**

Web 2												
ASX Code	**Source**	**Co-opt**	**Size**	**Cat No**	**Composition**	**Size**	**Cat No**	**Committees**	**Cat No**	**MarkCap**	**Size**	**Cat No**
ABZ	Web2	0.00	None		0.60	Medium		2		30,583,000	Small	
ANO	Web2	0.00	None		0.50	Medium	8	1	8	5,879,239	Small	
APK	Web2	0.50	High		0.50	Medium		3		91,010,374	Small	
AZX	Web2	0.00	None		0.60	Medium		1		54,208,691	Small	
CGT	Web2	0.00	None		0.33	Low		1		61,132,207	Small	
CSD	Web2	0.00	None	12	0.33	Low	3	1		11,658,710	Small	
CZA	Web2	0.43	High	10	0.43	Low		2		624,089,101	Medium	
DGI	Web2	0.00	None		0.75	High		2	5	1,670,055	Small	17
EPL	Web2	0.00	None		0.50	Medium		3	7	6,546,026	Small	
ERA	Web2	0.50	High		0.83	High		1		883,116,634	Medium	
FBU	Web2	0.38	Low		0.75	High		3		4,614,300,276	Large	1
GOA	Web2	0.00	None		0.71	High		1		51,105,803	Small	
LRG	Web2	0.67	High		0.67	High		3		11,083,603	Small	
MOY	Web2	0.60	High		0.80	High		0		38,997,286	Small	
MRE	Web2	0.43	High		0.63	High	13	3		847,832,753	Medium	
MTE	Web2	0.80	High		0.80	High		0		62,195,907	Small	
NMS	Web2	0.00	None		0.60	Medium		1		59,418,818	Small	
PHK	Web2	0.00	None		0.67	High		2		19,589,613	Small	
PNW	Web2	0.00	None		0.75	High		0	4	16,107,459	Small	
PRG	Web2	0.29	Low	2	0.57	Medium		3		252,883,603	Medium	6
RDM	Web2	0.00	None		0.67	High		0		21,403,941	Small	
SYM	Web2	0.67	High		0.67	High		1		81,341,668	Small	
TWR	Web2	0.71	High		0.71	High		2		347,956,551	Medium	
WCB	Web2	0.50	High		0.50	Medium		3		257,732,886	Medium	
Total				**24**			**24**		**24**			**24**

APPENDIX 5A

THE EXCEL DATA FILES OF ALL THE VARIABLES

Asx Code	InfoFinD1	InfoFinD2	InfoFinD3	InfoFinD4	InfoFinO5
AAD	4	5	6	6	7
AAO	1	1	2	1	1
ABZ	1	1	1	1	1
AEJ	2	1	2	2	6
AEO	7	6	6	6	7
AGF	6	6	6	6	3
AGO	3	6	5	3	6
AGS	3	1	4	1	6
AIR	7	5	4	4	5
AJL	2	2	2	2	2
ALU	6	6	6	6	4
ALY	1	1	6	1	5
ANG	6	6	5	6	6
ANO	7	7	7	6	4
ANP			7		
APK	7	5	6	6	6

APPENDIX 5B

THE EXCEL FILE OF THE BI-VARIATE PEARSON PRODUCT MOMENT CORRELATION OF THE INDEPENDENT VARIABLES

Independent Variable Bi-variate Pearson Product Moment Correlation

		InfoFinD1	InfoFinD2	InfoFinD3	InfoFinD4	InfoFinO5
InfoFinD1	Pearson Correlation	1	.820**	.539**	.678**	-.467**
	Sig. (2-tailed)		.000	.000	.000	.000
InfoFinD2	Pearson Correlation	.820**	1	.558**	.775**	-.452**
	Sig. (2-tailed)	.000		.000	.000	.000
InfoFinD3	Pearson Correlation	.539**	.558**	1	.715**	-.275**
	Sig. (2-tailed)	.000	.000		.000	.004
InfoFinD4	Pearson Correlation	.678**	.775**	.715**	1	-.414**
	Sig. (2-tailed)	.000	.000	.000		.000
InfoFinO5	Pearson Correlation	-.467**	-.452**	-.275**	-.414**	1
	Sig. (2-tailed)	.000	.000	.004	.000	
InfoFinO6	Pearson Correlation	-.081	-.095	-.002	-.175	.521**
	Sig. (2-tailed)	.404	.325	.982	.069	.000
InfoFinO7	Pearson Correlation	-.186	-.137	-.291**	-.301**	.301**
	Sig. (2-tailed)	.053	.156	.002	.001	.001

APPENDIX 5C

FURTHER ANALYSIS OF THE DATA:

HENDRY AND KIEL'S (2004) TYPOLOGY EXPLORED

TABLE OF CONTENTS

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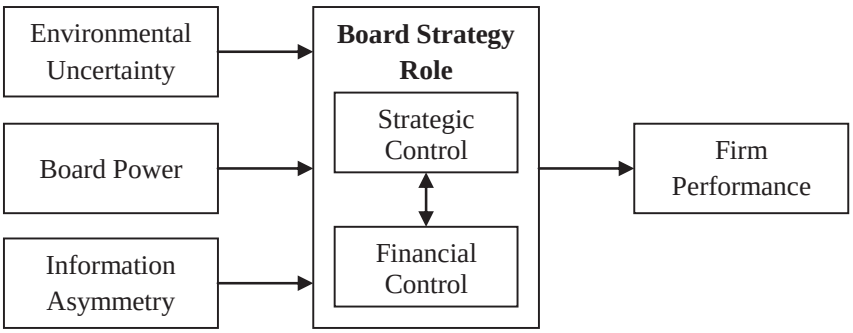
LIST OF TABLES

5C.0 INTRODUCTION

Hendry and Kiel (2004) developed a typology that classifies a board into four strategic types (refer to Figure 3.2 in Chapter 3), which is based on a strategic and financial control role dichotomy. They argue that the relative emphasis on either the strategic or financial control role is contingent upon three contextual factors: Environmental Uncertainty, Board Power, and Information Asymmetry (refer to Figure 5C.1). The purpose of this appendix is to examine this proposition using this study's data set. This appendix proceeds as follows: Section 5C.1 discusses the literature and theory and Section 5C.2 superimposes this study's data set into the Hendry and Kiel (2004) typology. Section 5C.3 discusses the implications of this study's data variables in relation to the Hendry and Kiel (2004) typology and Section 5C.4 develops the data and variables. Section 5C.5 tests the propositions using Pearson Correlation and Section 5C.6 presents the findings and discussion. Section 5C.7 summarises the appendix.

Figure 5C.1 Board Role Contingency Framework (Hendry and Kiel 2004, p. 513)

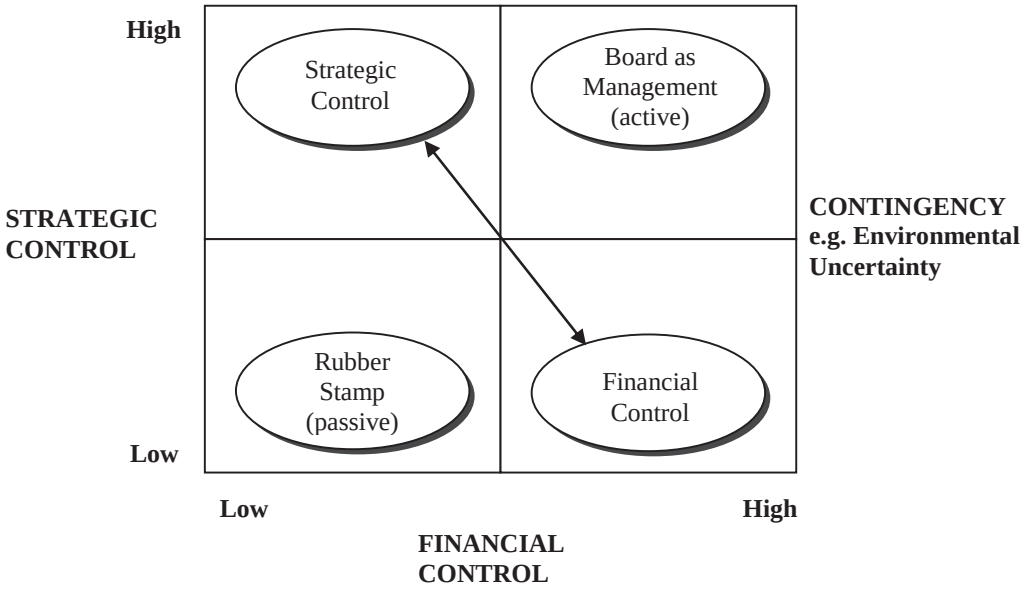


5C.1 LITERATURE AND THEORY

Research suggests a shift away from a passive board control role to a more active control role in strategy (Hendry & Kiel, 2004) and the board as 'no more than a sign-off on strategy' appears to be rare (Stiles, 2001) . In addition, organisational behaviour suggests that strategic advice and counsel are essential in the running of modern corporations and are critical of 'rubberstamp' boards (Finegold et al., 2001). In recognising the board as a control mechanism, Hendry and Kiel (2004) draw on both Organisational

Theory and Control (Ouchi, 1979) and Economic (Agency Theory) Control (Eisenhardt, 1985) and introduce a board typology (refer to Figure 5C.2) where it is possible to establish an association between aspects of the Board's Control Role in strategy.

Figure 5C.2 Board Control Role Typology (Hendry and Kiel 2004, p. 512)



By recognising a board's 'passive (rubber stamp)/active (board as management) control continuum' in strategy, Hendry and Kiel (2004) characterise a board's control role based on a financial control and strategic control dichotomy. Boards that emphasise both strategic and financial controls are regarded as 'board as management,' while boards that place low emphasis on either control are considered 'rubberstamp' boards.

5C.2 SUPERIMPOSING THIS STUDY'S DATA SET INTO THE HENDRY AND KIEL (2004) TYPOLOGY

The survey collected responses to six questions, sourced from Hendry and Kiel (2004), to determine the Board's Strategic and Financial Control Roles. Questions 25-27 (refer to Table 5C.1) relate to the board's

strategic control role and Questions 28-30 (refer to Table 5C.1) relate to the board's financial control role.

Table 5C.1 Survey Questions to Determine the Board's Control Role in Strategy

Question Number	Survey Question	Named in SPSS	Source
Section D	Please indicate to what extent you agree with the following statements:		
Q25	The board shapes the **context** of strategy by setting the conditions under which the strategy process happens in the organisation.	BrdStrt25	Hendry, K. and G. C. Kiel (2004)
Q26	The board shapes the **content** of strategy by requiring that management justify their intentions, by evaluating alternatives and by continuously monitoring progress during formulation and assessment stage.	BrdStrt26	Hendry, K. and G. C. Kiel (2004)
Q27	The board shapes the **conduct** of strategy by continuously monitoring implementation and results and by making changes where appropriate.	BrdStrt27	Hendry, K. and G. C. Kiel (2004)
Q28	The board sets financial targets only and takes strategic decisions relative to these financial targets by approving, rejecting, or referring strategic proposals back to management.	BrdFin28	Hendry, K. and G. C. Kiel (2004)
Q29	The board exerts influence over management at formal board meetings after resources have been committed and spending approved.	BrdFin29	Hendry, K. and G. C. Kiel (2004)
Q30	The board evaluates management on the financial results of the firm.	BrdFin30	Hendry, K. and G. C. Kiel (2004)

As the Hendry and Kiel (2004) strategic and financial control typology (refer to Figure 5C.2) can be seen as the foundation or building block that leads to the contingency framework (refer to Figure 5C.1), two variables, 'Strategic Control' and 'Financial Control', from the six survey question responses are determined. By determining the two variables, this research's data set can be superimposed into the Hendry and Kiel (2004) typology (refer to Figure 5C.2).

'Strategic Control': A Pearson Correlation (refer to Chapter 5, page 26) confirmed that significant positive correlations (**significant at the 0.01 level (2-tailed)) exist between the three board strategic role variables: BrdStrt25, BrdStrt26, and BrdStrt27. With a reliability analysis Cronbach's alpha of .803, the three variables are averaged to determine the 'strategic control' variable. A frequency table of the 'strategic control' variable (refer to Figure 5C.3A) revealed that, based on a Likert scale score above 3, 98%

of the boards surveyed (126 out of 129) regard themselves as having strategic control roles.

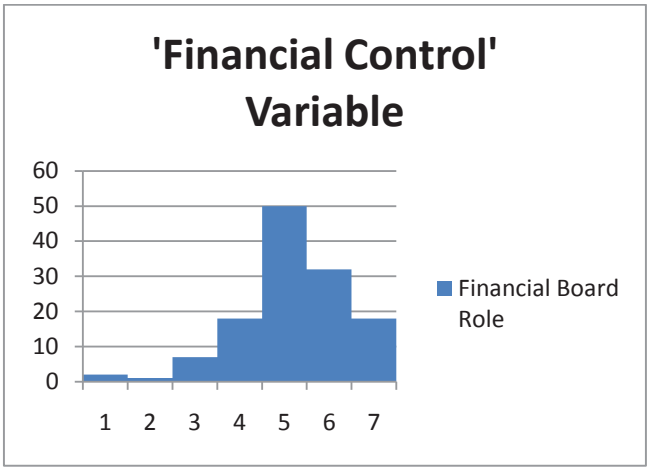
Figure 5C.3A Strategic Control Variable Frequency Table

'Strategic Control'	
Scales	**Freq**
1	1
2	2
3	2
4	9
5	28
6	60
7	27
	129

'Financial Control': The same Pearson Correlation (refer to Chapter 5, page 26) also confirmed a significant positive correlation (**significant at the 0.01 level (2-tailed)) between two board financial role variables: BrdFin29 and BrdFin30. With a reliability analysis Cronbach's alpha of .5, the two variables are averaged to determine the 'financial control' variable. A frequency table of the 'financial control' variable (refer to Figure 5C.3B) revealed that, based on a Likert scale score above 3, 98% of the boards surveyed (125 out of 128) regard themselves as having financial control roles.

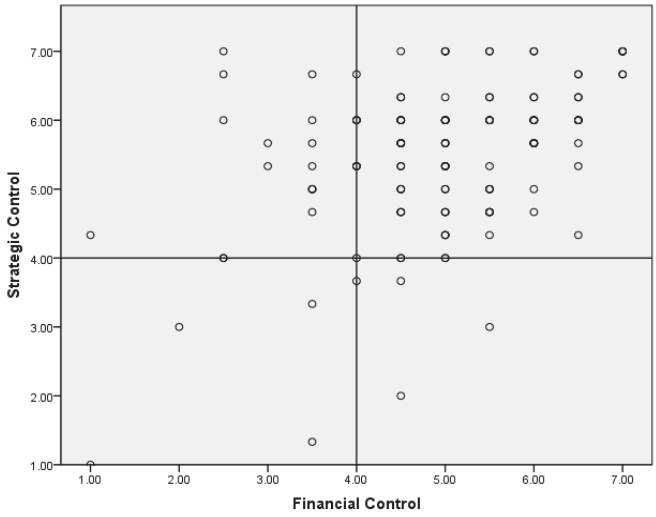
Figure 5C.3B Financial Control Variable Frequency Table

'Financial Control'	
Scales	**Freq**
1	2
2	1
3	7
4	18
5	50
6	32
7	18
	128



As discussed in Chapter 5, the results suggest that this study's data set could be considered a 'Board as Management' control type. The strategic and financial control variables were superimposed (refer to Figure 5C.4) into the Hendry and Kiel (2004) typology. With regards to board theory, the 'board as management' or the active 'school of thought' is underpinned by stewardship (Muth & Donaldson, 1998), agency (Eisenhardt, 1989) and resource dependence (Zahra & Pearce II, 1989) theories. Stewardship theory argues against opportunistic self-interest, claiming intrinsic motivation contributes to the overall stewardship of the company. Agency theory argues that the role of the board is to reduce the potential conflict of interest between shareholders and management and has clear implications for the monitoring and control role of the board. Resource dependence theory argues that boards are a mechanism to access important resources, acting as strategic consultants to TMTs. With regards to the normative literature, there is a clear convergence, though not empirically established, that boards have a definite role to play in strategy (Hendry & Kiel, 2004). Finally, the academic literature over the last 20 years demonstrates a shift away from the 'rubberstamp' role of the 1970s and 1980s to the 'board as management' role (Hendry & Kiel, 2004).

Figure 5C.4 Strategic and Financial Control Variables Superimposed into the Hendry and Kiel (2004) Typology



5C.3 THE HENDRY AND KIEL (2004) CONTIGENCY PROPOSITIONS

Hendry and Kiel (2004) argue that the relative emphasis on either the strategic or financial control role is contingent upon three contextual factors: Board Power, Environmental Uncertainty, and Information Asymmetry (refer to Figure 5C.1). Supporting this argument, Hendry and Kiel (2004) suggest that more powerful boards are associated with higher levels of involvement in strategy and, as Environmental Uncertainty escalates, management becomes more risk averse, therefore placing an emphasis on behavioural (strategic) control. However, in the case of incomplete information, principals contract on outcomes and, as such, information asymmetry is related to financial control by the board (Hendry & Kiel, 2004).

Based on the three contextual factors: Board Power, Environmental Uncertainty, and Information Asymmetry, Hendry and Kiel (2004) propose the following:

P1: The power of the board is positively (negatively) related to strategic control (financial control) by the board.

P2: Environmental uncertainty is positively (negatively) related to strategic control (financial control) by the board.

P3: Information asymmetry is negatively (positively) related to strategic control (financial control) by the board.

However, based on the Board as Management type in this study's data set that recognises and includes both financial and strategic control roles, it would be expected that correlations between the contingencies and board type would be not significant as statistically, the negative and positive relationships will cancel out. Further research, with a strategic control and financial control sample, would be required to test the positive/negative relationships.

5C.4 DATA AND VARIABLES

5C.4.1 Independent Variables

The independent variables are the balance of the factors determined in Chapter 5 (refer to Table 5.8 below, copied from Chapter 5 for convenience) and are: Board Power "power", Environmental Uncertainty "eu1" and "eu2", and Information Asymmetry "assy".

Copied from Chapter 5: Table 5.8 - Final Seven-Factor Loading Matrix

Rotated Component Matrix[a]							
	Component						
Variables	**I**	**assy**	**B**	**eu1**	**S**	**power**	**eu2**
InfoCstD12	**.931**	-.004	.003	.042	.088	.017	.028
InfoCstO13	**-.917**	.035	-.032	-.046	-.044	-.024	-.028
InfoCstD14	**.898**	-.041	-.002	-.005	-.048	.041	.078
InfoCstO9	**-.870**	.049	-.078	-.048	-.037	-.021	-.111
InfoCstO11	**-.867**	.066	-.084	-.037	.037	-.021	-.043
InfoFinD2	**.794**	.009	.009	.158	.138	.168	-.050
InfoFinD4	**.790**	-.055	.140	.191	.145	.080	-.001
InfoFinD3	**.678**	-.121	.211	.220	.371	-.061	-.035
BrdIA31	-.084	**.919**	.078	.076	-.065	-.019	-.080
BrdIA32	-.107	**.910**	.108	.048	-.002	-.129	-.046
BrdIA33	-.039	**.827**	.213	.111	.068	.097	.053
BrdStrt27	.133	.153	**.853**	-.004	.057	-.056	-.089
BrdStrt25	.018	.013	**.821**	.021	-.048	.017	.116
BrdStrt26	.166	.266	**.813**	-.004	-.107	-.006	.056
BrdEU24	.097	.126	.046	**.837**	.157	-.087	.049
BrdEU20	.305	.104	-.019	**.832**	-.067	.094	.027
StrtDC35	.036	-.059	-.173	.084	**.821**	.104	-.148
StrtPE36	.252	.068	.061	-.006	**.812**	.006	.064
Coopt	.120	-.162	-.033	.064	.033	**.793**	-.115
TenR	.003	.017	.111	-.319	.034	**.665**	.004
Comp	.102	.143	-.158	.275	.053	**.630**	.243
BrdEU23	.011	.049	.035	-.080	.022	.100	**.857**
BrdEU16	.120	-.133	.051	.169	-.110	-.079	**.783**

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Board Power

The Board Power variable is named “power” and is measured by CEO duality, relative tenure, co-opting (percentage of board composed of outside directors appointed after a CEO), composition (independent/dependent boards), and outside share ownership, as proposed by Zajac and Westphal (1996). The archival data was sourced from DatAnalysis (Morning Star). Three of the five measures, namely tenure, co-opting, and composition, loaded in “power”.

Environmental Uncertainty

Environmental uncertainty is measured using the survey questions developed by Gordon and Narayanan (1984). Economic, Technological, Competitive, and Customer Aspects are measured in ten survey questions (refer to Table 5C.2).

Table 5C.2 Survey Questions to Determine Environmental Uncertainty

Question Number	Survey Question	Source
Section C	How intense is each of the following in your industry?	
Q15	Bidding for purchases or raw materials	Gordon, L. A. and V. K. Narayanan (1984)
Q16	Competition for manpower	Gordon, L. A. and V. K. Narayanan (1984)
Q17	Price competition	Gordon, L. A. and V. K. Narayanan (1984)
Q18	How many new products and/or services have been marketed during the past 5 years by your industry?	Gordon, L. A. and V. K. Narayanan (1984)
	How stable/dynamic is the external environment (economic and technological) facing your firm?	
Q19	Economic	Gordon, L. A. and V. K. Narayanan (1984)
Q20	Technological	Gordon, L. A. and V. K. Narayanan (1984)
Q21	How would you classify the market activities of your *competitors* during the past 5 years?	Gordon, L. A. and V. K. Narayanan (1984)
Q22	During the past 5 years, the tastes and preferences of your *customers* have become	Gordon, L. A. and V. K. Narayanan (1984)
Q23	During the past 5 years, the legal, political and economic constraints surrounding your firm have	Gordon, L. A. and V. K. Narayanan (1984)
Q24	How often do new technological advances emerge in your industry?	Gordon, L. A. and V. K. Narayanan (1984)

Technological uncertainty (questions 20 and 24 in the survey) loads in “eu1” and economic uncertainty (questions 16 and 23 in the survey) loads in “eu2”.

Information Asymmetry

The Information asymmetry variable is named “assy” and is measured using the survey questions (refer to Table 5C.3) offered by Rutherford and Buchholtz (2007). Three of the four questions (questions 31 to 33 in the survey) load in the “assy” factor.

Table 5C.3 Survey Questions to Determine Information Asymmetry

Question Number	Survey Question	Source
Section E		
Q31	In general, the information available to the board is very reliable	Rutherford, M. A. and A. K. Buchholtz (2007)
Q32	In general, the available information is relevant to the board's needs	Rutherford, M. A. and A. K. Buchholtz (2007)
Q33	In general, the board receives information in a timely fashion	Rutherford, M. A. and A. K. Buchholtz (2007)
Q34	At a typical board meeting, the board actively probes for information necessary to carry out their duties	Rutherford, M. A. and A. K. Buchholtz (2007)

5C.4.2 Dependent Variable

The dependent variable is Variable B determined in Chapter 5 (refer to Table 5.8 above, copied from Chapter 5 for convenience), which measures the Board's Control Role Type in this study's data set.

5C.5 TESTING PROPOSITIONS USING PEARSON CORRELATION

5C.5.1 Normal Distribution Properties and Descriptive Statistics

After screening the independent variables, two extreme outliers were detected in the "power" variable and were deleted. The initial descriptive statistics (refer to Table 5C.4A) reveal moderate negative skewness in variables "assy" and "eu2". After square root transformation, the new variables "SqAssy" and "SqEu2" resulted in a more normal distribution (refer to Table 5C.4B), which are also illustrated in the histograms (refer to Figures 5C.5A, 5C.5B, 5C.5C, and 5C.5D).

Table 5C.4A Initial Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
eu1	114	-3.07450	1.99711	.0000000	1.00000000	-.239	-.431
power	112	-1.97376	1.65038	-.0839818	.75884450	.078	-.376
SqAssy	114	1.46	2.79	1.9858	.23929	.816	1.042
SqEu2	114	1.48	2.66	1.9851	.24498	.409	.060
Valid N (listwise)	112						

Table 5C.4B Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
assy	114	-3.77854	1.87847	.0000000	1.00000000	-1.220	2.049
eu1	114	-3.07450	1.99711	.0000000	1.00000000	-.239	-.431
eu2	114	-3.07045	1.80403	.0000000	1.00000000	-.748	.580
power	112	-1.97376	1.65038	-.0839818	.75884450	.078	-.376
Valid N (listwise)	112						

Figure 5C.5A Power Histogram

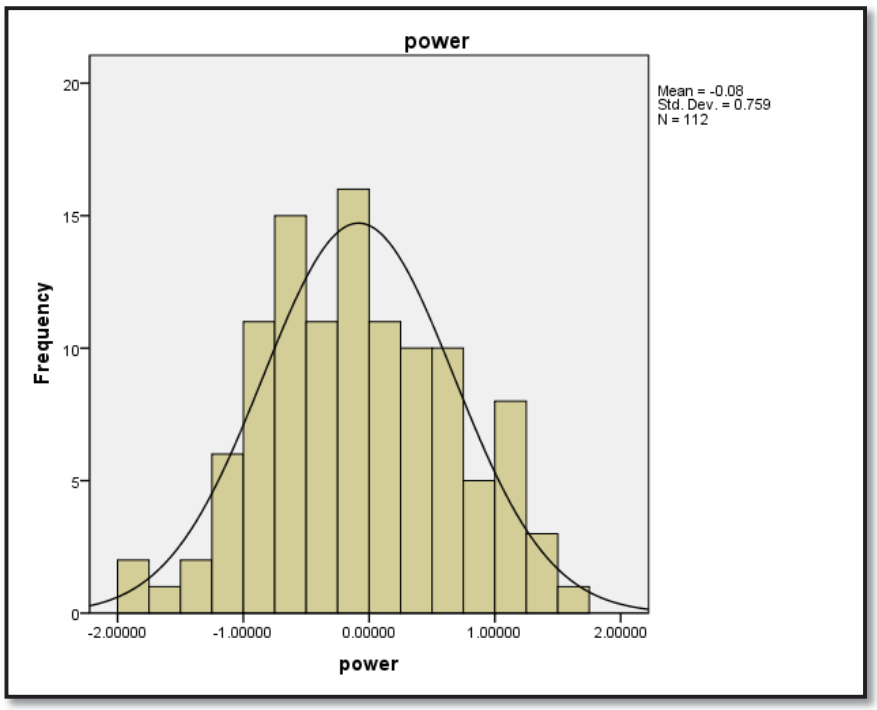


Figure 5C.5B Information Asymmetry Histogram

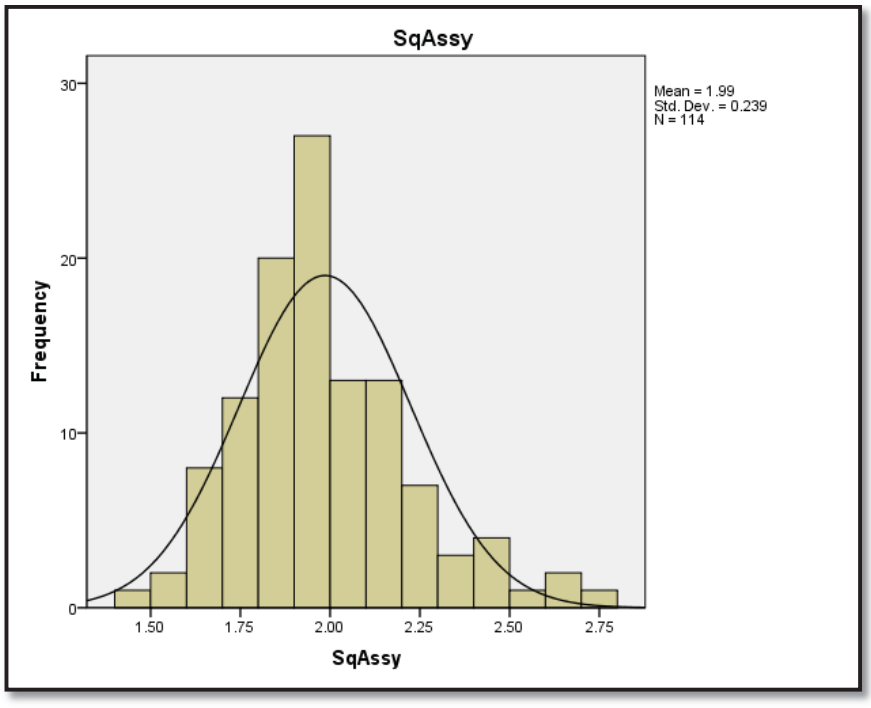


Figure 5C.5C Environmental (technological) Uncertainty 1 Histogram

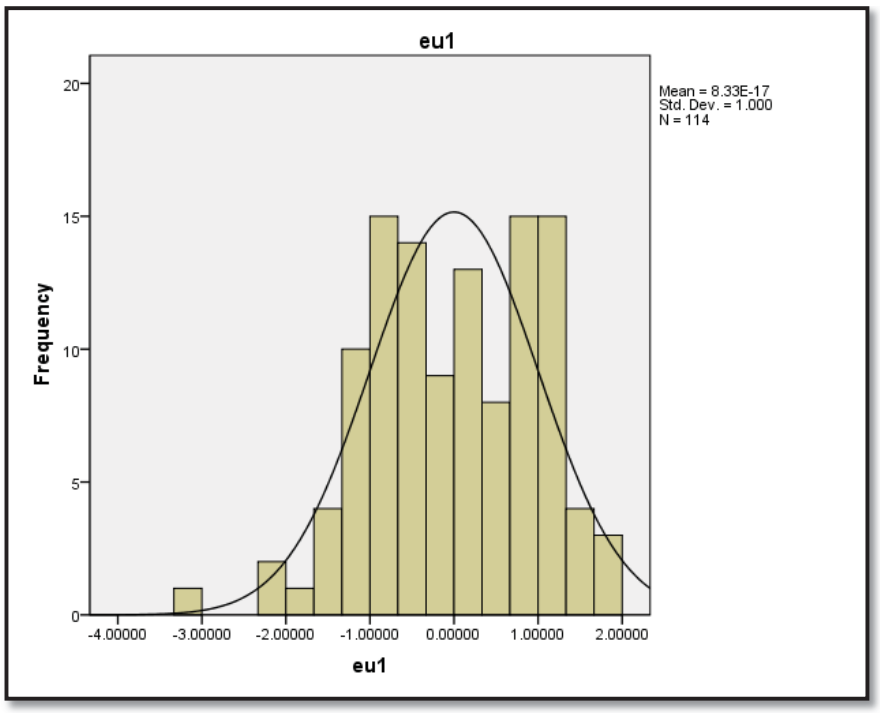
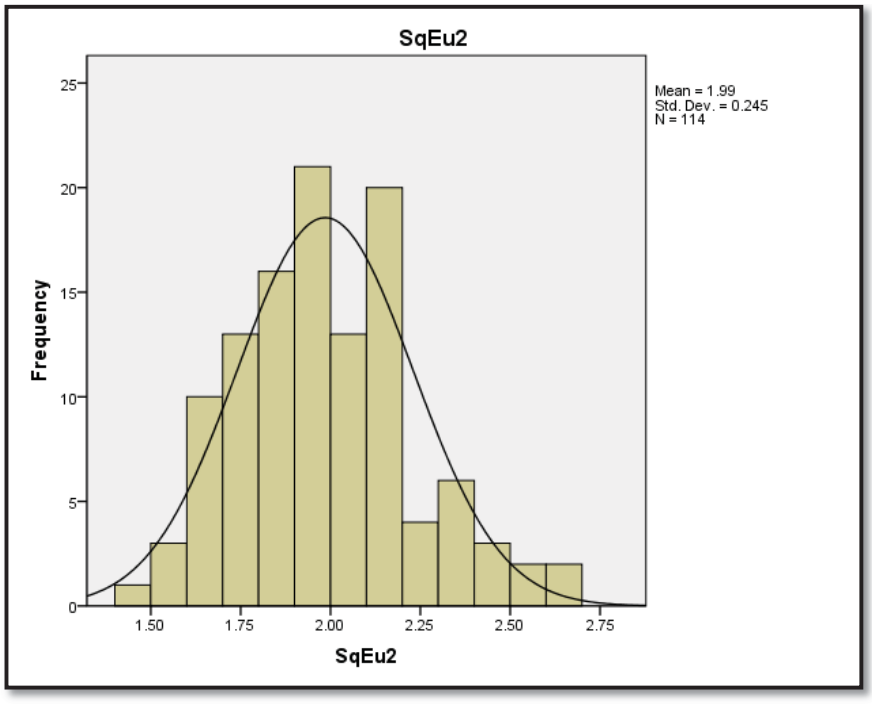


Figure 5C.5D Environmental (economic) Uncertainty 2 Histogram



5C.5.2 Pearson Correlation

The Pearson coefficient of correlation is used to measure the strength of association between the four independent variables (eu1, power, SqEu2, and SqAssy) and the dependent variable (B). The results of the correlation of the independent variables: eu1, power, SqEu2, and SqAssy, with dependent variable B, are not significant.

Table 5C.5 Pearson Correlation Coefficient Matrix of 'eu1', 'power', 'SqEu2', SqAssy', and 'B'

		SqEu2	SqAssy	eu1	power	B
SqEu2	Pearson Correlation	1	.024	.010	.011	-.047
	Sig. (2-tailed)		.803	.913	.909	.622
	N	114	114	114	112	114
SqAssy	Pearson Correlation	.024	1	-.001	.034	-.134
	Sig. (2-tailed)	.803		.988	.725	.154
	N	114	114	114	112	114
eu1	Pearson Correlation	.010	-.001	1	.287**	.006
	Sig. (2-tailed)	.913	.988		.002	.949
	N	114	114	114	112	114
power	Pearson Correlation	.011	.034	.287**	1	-.075
	Sig. (2-tailed)	.909	.725	.002		.430
	N	112	112	112	112	112
B	Pearson Correlation	-.047	-.134	.006	-.075	1
	Sig. (2-tailed)	.622	.154	.949	.430	
	N	114	114	114	112	129
**. Correlation is significant at the 0.01 level (2-tailed).						

5C.6 FINDINGS AND DISCUSSION

Consistent with the literature and board theories (Eisenhardt, 1989; Muth & Donaldson, 1998; Zahra & Pearce II, 1989), this study's data set finds that boards do emphasise a 'board as management' role in

strategy. Boards which emphasise both financial control and strategic control roles would be classed as a 'board as management' in the Hendry and Kiel (2004) typology. However, this study's sample considered themselves as both financial and strategic control role types. As a result, it would be expected that the correlation between the contingencies: Information Asymmetry, Board Power, and Environmental Uncertainty and board's strategic and financial control roles, as proposed by Hendry and Kiel (2004), would be not significant. Further research, with a strategic control and financial control sample, would be required to test the positive/negative relationships.

5C.7 APPENDIX SUMMARY

This appendix tests the propositions that the relative emphasis on the board's strategic versus financial control role is contingent upon Board Power, Environmental Uncertainty, and Information Asymmetry, as offered by Hendry and Kiel (2004). This study's sample is characterised by the 'board as management' type, which recognises and includes both financial and strategic control roles and, as such, finds no correlation between the contingencies and the Board's Control Role. The 'board as management' findings are consistent with board theory and both the normative and academic literature.

APPENDIX 5D

THE EXCEL FILE OF THE BI-VARIATE PEARSON PRODUCT MOMENT CORRELATION OF THE DEPENDENT VARIABLES

Dependent Variable Bi-variate Pearson Product Moment Correlation

		ROA08	ROA09	ROE08	ROE09	EBIT08	EBIT09
ROA08	Pearson Correlation	1	.639**	.966**	.574**	.144	.089
	Sig. (2-tailed)		.000	.000	.000	.142	.371
	N	131	131	130	130	106	103
ROA09	Pearson Correlation	.639**	1	.619**	.921**	.300**	.396**
	Sig. (2-tailed)	.000		.000	.000	.002	.000
	N	131	137	130	136	106	105
ROE08	Pearson Correlation	.966**	.619**	1	.585**	.131	.082
	Sig. (2-tailed)	.000	.000		.000	.179	.409
	N	130	130	130	130	106	103
ROE09	Pearson Correlation	.574**	.921**	.585**	1	.197*	.279**
	Sig. (2-tailed)	.000	.000	.000		.043	.004
	N	130	136	130	136	106	105
EBIT08	Pearson Correlation	.144	.300**	.131	.197*	1	-.001
	Sig. (2-tailed)	.142	.002	.179	.043		.992
	N	106	106	106	106	106	98
EBIT09	Pearson Correlation	.089	.396**	.082	.279**	-.001	1
	Sig. (2-tailed)	.371	.000	.409	.004	.992	
	N	103	105	103	105	98	105